

Calendar No. 506

104TH CONGRESS }
2d Session }

SENATE

{ REPORT
104-327 }

**NATIONAL AERONAUTICS AND SPACE AD-
MINISTRATION AUTHORIZATION ACT,
FISCAL YEAR 1997**

R E P O R T

OF THE

COMMITTEE ON COMMERCE, SCIENCE, AND
TRANSPORTATION

ON

S. 1839



JULY 22, 1996.—Ordered to be printed

U.S. GOVERNMENT PRINTING OFFICE

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WASHINGTON : 1996

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION

ONE HUNDRED FOURTH CONGRESS

SECOND SESSION

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JULY 22, 1996.—Ordered to be printed

Mr. PRESSLER, from the Committee on Commerce, Science, and
Transportation, submitted the following

REPORT

[To accompany S. 1839]

The Committee on Commerce, Science, and Transportation, to which was referred the bill (S. 1839) “To authorize appropriations for fiscal year 1997 to the National Aeronautics and Space Administration for human space flight; science, aeronautics, and technology; mission support; and Inspector General; and for other purposes”, having considered the same, reports favorably thereon with an amendment and recommends that the bill as amended do pass.

PURPOSE OF THE BILL

The purpose of the bill is to authorize appropriations to NASA totalling \$13,702,600,000 for fiscal year (FY) 1997 as follows:

[By fiscal year, in millions of dollars]

FY 1997	Budget request	Committee authorization
Space Flight	\$5,354.6	\$5,354.6
Science, Aeronautics, and Technology	5,862.1	5,760.5
Mission Support	2,570.5	2,570.5
Inspector General	17.0	17.0
Total	13,804.2	13,702.6

BACKGROUND AND NEEDS

In the past, the main challenges NASA faced were technological. Today, NASA faces new challenges which are budgetary as well as technical, but no less daunting than the Apollo missions to the

Moon. To the credit of the space agency, rather than merely agonize about the current budget challenge faced by the Federal Government, NASA has confronted the budget problem directly. Last year, NASA developed an ambitious budget-cutting plan to reduce its budget by \$4 billion between fiscal years 1997 and 2000. Under the plan, NASA funding would drop from its current level of \$13.9 billion to \$11.6 billion by the year 2000.

In seeking to implement its plan, over the last two years NASA has conducted a comprehensive review of its entire operation to identify potential areas for cost savings, begun new technology programs to reduce the cost of access to space and of space science and exploration missions, and committed to reducing its workforce from 25,000 full time equivalents (FTEs) to 17,500 by the year 2000. There is broad appreciation for the difficulty in making these budget cuts while at the same time fulfilling its commitment to major multi-billion-dollar initiatives like Space Station and Mission to Planet Earth. To many, it appears that NASA's budget is barely sufficient to sustain its core missions and that further cuts by Congress might prevent the agency from realizing its bold visions in space science and exploration.

To meet successfully these new budget and program challenges, NASA cannot settle for marginal changes, but must reassess its traditional ways of doing business. In carrying out its goals and missions, NASA will need to make more use of cost-sharing partnerships with industry, academia, and non-federal entities as well as with other spacefaring nations. The agency will also need to explore the possibilities of privatizing those activities that can be more cost-effectively performed by the private sector and of purchasing goods and services on a commercial basis when appropriate. Equally important, in justifying its budget, NASA must make special efforts to ensure that its missions and programs are relevant, not just to the narrow group of individuals and interests directly involved, but to the general public. For instance, the global climate change research of Mission to Planet Earth, if managed properly, has the potential to make enormous impacts in the work of real people in such diverse areas as agriculture, forestry, mineral exploration, water resource management, and land use planning. Similarly, NASA's space education and outreach activities like the Experimental Program to Stimulate Competitive Research, the Teacher Resource Centers, and the Space Grant Program have proven very effective in giving citizens of all ages and backgrounds, as well as a broad range of government, private sector, and academic institutions, a stake in the U.S. space program and our ongoing technological revolution.

As NASA deals with these and other budgetary and programmatic challenges, it is important that safety be a top priority. However, it is equally critical that safety issues not be used as an excuse to avoid taking technological risk, but instead legitimately raised out of concern for the lives of the people who make the U.S. space program a success. Risk assessment and management will take on increasing importance in the upcoming decade when the International Space Station effort will require astronauts to perform an unprecedented amount of spacewalking to build, maintain,

and operate the space facility and will force the Space Shuttle to satisfy a challenging launch schedule.

Even within current federal budget constraints, NASA requires a certain minimal level of funding to plan and carry out the bold space activities that historically have defined the agency. Funding must be sufficient to support core ongoing programs as well as new initiatives to address future aerospace needs. This authorization legislation for FY 1997 is intended to provide the agency with the funding and policy guidance to maintain a robust and balanced space program in this environment.

The rapidly growing commercial space launch industry also is facing new challenges as conventional expendable launch vehicles may soon be joined by vehicles with reentry capabilities and other new technologies. A major factor in the development of that industry was the enactment of legislation establishing an appropriate regulatory scheme for licensing commercial launches and setting the insurance requirements for launch providers. The Commercial Space Launch Act of 1984, as amended (CSLA), specifically authorizes the Department of Transportation (DOT) to license all U.S. commercial launches and establish insurance requirements for commercial launch providers as a condition of receiving a license. The insurance requirements were intended to protect against risks to Government property and against damages to third parties that might result from launch mishaps. However, these requirements also were intended to limit the potential liability of the providers and thereby encourage their entry into the emerging commercial launch market. Under the present regulatory regime, the provider is required to purchase insurance up to a DOT-determined level, with the federal government indemnifying the provider for liability above that level up to a specified ceiling. Unfortunately, the commercial use of reentry vehicles, the operation of reentry sites, and the possibility of commercial in-space activities were not contemplated when the CSLA was enacted. Accordingly, questions have been raised about whether these activities are covered by the existing regulatory scheme authorized by the CSLA. Amendments to the CSLA are required to clarify the regulatory and licensing authority of the DOT over these matters and to allow providers of these new activities to participate in the risk management structure established by the CSLA. This legislation is intended to make those clarifying amendments and, by so doing, equip DOT to address critical public safety issues and enhance the competitiveness of the U.S. launch industry as new space transportation systems and facilities enter the global marketplace.

LEGISLATIVE HISTORY

On March 18th, the Administration submitted its FY 1997 budget request for NASA to the Congress. The Subcommittee on Science, Technology, and Space held two oversight hearings on NASA's programs. On March 26th, the Subcommittee held a hearing on the FY 1997 budget and programs of NASA, at which testimony was heard from NASA Administrator Daniel S. Goldin. Subsequently, on May 16th, a hearing was held on the Mission to Planet Earth program. At that hearing, the Subcommittee heard testimony from Dr. Charles Kennel, NASA's Associate Administrator

for Mission to Planet Earth; Mr. Robert S. Winokur, Assistant Administrator for Satellite and Information Services, National Oceanic and Atmospheric Administration; Dr. Don Lauer, Chief, EROS Data Center, Sioux Falls, South Dakota; Dr. Frank Carsey, Chief Scientist, Alaska Synthetic Aperture Radar Facility; Dr. George Seilestad, University of North Dakota (Aerospace Activities); and Mr. David Radzanowski, Aerospace Policy Analyst, Congressional Research Service. In addition, the Subcommittee was shown a NASA demonstration of the Earth imagery from the Mission to Planet Earth program which highlighted its many practical applications.

On June 5th, Chairman Pressler, along with Senators Burns and Stevens, introduced S. 1839, a bill to authorize appropriations for NASA for FY 1997. On June 6th, the Committee met in open executive session and, on a voice vote, ordered the bill reported with one amendment. That amendment, offered by Senator Rockefeller, requires NASA to develop a strategic plan for its educational activities relating to the International Space Station program.

SUMMARY OF MAJOR PROVISIONS

For FY 1997, the bill, as reported, authorizes a total of \$13,702,600,000 for NASA.

NASA AUTHORIZATION

The \$13,702,600,000 authorized for NASA is allocated among its major accounts as follows: \$5,354,600,000 for Human Space Flight, \$5,760,500,000 for Science, Aeronautics, and Technology; \$2,570,500,000 for Mission Support, and \$17,000,000 for the Office of the Inspector General.

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION—NASA BUDGET SPREAD SHEET FOR FISCAL YEAR 1997 [By fiscal year, in millions of dollars]

	Fiscal year 1996 appropriation	Fiscal year 1996 request	Proposed fiscal year 1997 Sen- ate authorization
I. Human Space Flight	5,456.6	5,354.6	5,354.6
1. Space Station	1,863.6	1,802.0	1,802.0
2. US/Russian Cooperation Program	129.2	138.2	138.2
3. Space Shuttle	3,148.8	3,142.6	3,142.6
4. Payload and Utilization Operation	315.0	271.8	271.8
II. Science, Aeronautics, and Technology	5,845.9	5,862.1	5,760.5
1. Space Science	2,032.6	1,857.3	1,797.7
AXAF	237.6	178.6	178.6
Cassini	191.5	106.7	106.7
Gravity Probe B	51.5	59.6	0.0
Payload and Instrument Development	30.7	16.9	16.9
Explorers	132.2	135.0	135.0
Discovery Program	102.2	74.8	74.8
Mars Surveyor Program	111.9	90.0	90.0
New Millennium Spacecraft Program	30.0	21.5	21.5
Mission Operations and Data Analysis	563.8	592.4	592.4
Supporting Research and Technology	238.9	259.2	259.2
SIRTF	10.0	24.9	24.9
TIMED	15.0	15.0	15.0
Suborbital Program	88.0	69.1	69.1
SOFIA	30.0	26.3	26.3
Launch Services	254.3	253.5	253.5

SENATE COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION—NASA BUDGET SPREAD
SHEET FOR FISCAL YEAR 1997—Continued
[By fiscal year, in millions of dollars]

	Fiscal year 1996 appropriation	Fiscal year 1996 request	Proposed fiscal year 1997 Sen- ate authorization
2. Life and Microgravity Sciences and Applications	488.5	498.5	498.5
3. Mission to Planet Earth	1,289.4	1,402.1	1,402.1
EOS	535.3	585.7	585.7
EOS-AM Series	170.0	84.7	84.7
EOS-PM Series	101.8	171.2	171.2
Chemistry Spacecraft	27.3	77.4	77.4
Special Spacecraft	71.7	66.7	66.7
New Millennium Program	10.0	10.0	10.0
Landsat 7	78.8	73.9	73.9
Algorithm Development	75.7	101.8	101.8
EOSDIS	241.2	261.1	261.1
Earth Probes	46.0	47.1	47.1
TOMS	8.5	2.6	2.6
TRMM	24.2	20.9	20.9
Earth System Science Pathfinders	1.0	20.0	20.0
Experiments of Opportunity	4.6	3.6	3.6
Applied Research and Data Analysis	337.8	379.1	379.1
MTPE Science	248.2	277.1	277.1
Data Purchase		50.0	50.0
Upper Plains States' Hydrology Research Program	0.0	0.0	¹ 5.0
Upper Midwest Aerospace Consortium Program	0.0	0.0	5.0
Operations, Data Retrieval, and Storage	89.6	102.0	102.0
Global Observations to Benefit the Environment (GLOBE)	5.0	5.0	5.0
EOS Launch Services	107.1	124.1	124.1
4. Aeronautical Research and Technology	845.9	857.8	857.8
Yokoh Public Outreach Program	0.2	0.2	0.2
5. Space Access and Technology	641.3	725.0	683.0
Advanced Space Transportation	188.5	324.7	324.7
X-33	49.0	251.1	251.1
X-34	30.0	15.0	15.0
Advanced Space Transportation Technology Program (ASTT)		42.0	0.0
Radar Satellite Program	0.0	0.0	² 35.0
Rural Technology Transfer and Commercialization Center	0.0	0.0	5.0
6. Mission Communication Services	441.3	420.6	420.6
7. Academic Programs	106.9	100.8	100.8
Pavilion Regional Science Outreach Center	0.0	0.0	2.0
EPSCoR	4.9	4.5	³ 10.0
Rural Teacher Resource Center	0.0	0.0	1.0
III. Mission Support	2,502.2	2,570.5	2,570.5
1. Safety, Reliability and Quality Assurance	37.6	36.7	36.7
2. Space Communication Services	269.4	291.4	291.4
3. Research and Program Management	2,052.8	2,078.8	2,078.8
4. Construction of Facilities	142.4	163.6	163.6
IV. Inspector General	16.0	17.0	17.0
Totals	13,820.7	13,804.2	13,702.6

¹ \$5 million is included for this scientific investigation, which is part of the GEWEX program.

² \$35 million is included for phase A and B studies for new radar satellite program.

³ Help for states which are primarily rural or sparsely populated.

SPACE STATION

The reported bill authorizes the full \$1,802,000,000 allocated in the President's FY 1996 budget request for the International Space Station Program. This authorization level should permit NASA to maintain its current schedule which calls for a first element launch in 1997 and completion of construction in the year 2002. The bill also provides the full funding for three of the total of nine planned

Shuttle missions to the Russian space station *Mir* between 1995 and 1997. The Shuttle-*Mir* missions will help NASA and its international partners prepare for the construction of the Space Station, which is scheduled to begin in late 1997.

SPACE SHUTTLE

The reported bill authorizes the requested level of \$3,142,600,000 for the Space Shuttle program. This level should enable NASA to undertake seven Shuttle missions during FY 1997. The authorization will also support NASA's programs to improve and upgrade the Shuttle orbiters to enhance their performance and safety. The authorization, like the budget request, assumes cost savings made possible by the implementation of measures recommended by the earlier comprehensive review of the Shuttle program in FY 1995. These measures include reductions in the Shuttle flight rate and program content, increases in efficiency, and the transition to a consolidation of Shuttle operations contracts under one prime contractor. Full funding in FY 1997 is essential to the safe and effective operation of the Shuttle system as NASA transfers increased responsibility to the U.S. Space Alliance joint venture which has been designated to manage the program in the future.

PAYLOAD AND UTILIZATION OPERATIONS

The reported bill authorizes the requested level of \$271,800,000 for Payload and Utilization Operations. This account supports the processing and flight of shuttle payloads, efforts to reduce operations costs, and the implementation of flight and ground systems improvements. Also supported is the Spacelab, a reusable laboratory facility placed in the Space Shuttle to perform science and technology experiments.

SPACE SCIENCE

The reported bill authorizes \$1,797,700,000 for the Space Science account. The funding level will permit a continuation of NASA's ongoing space science activities in physics, astronomy, and planetary exploration, including the Advanced X-ray Facility (AXAF), the Explorer program, the *Cassini* mission to Saturn, the Discovery program, the Mars Surveyor mission, the Stratospheric Observatory for Infrared Astronomy (SOFIA), and the Space Infrared Telescope Facility (SIRTF). The bill also supports the budget request for the New Millennium program, an important initiative begun last year to develop technologies that will enable more frequent and less costly space missions on smaller spacecraft. The Space Science authorization level assumes no FY 1997 funding for the Gravity Probe-B (GPB) program, for which \$59,600,000 are allocated in the President's budget request. The deletion reflects a persistent ambivalence within the scientific community about the merit of GPB relative to that of other space science projects.

LIFE AND MICROGRAVITY SCIENCE AND APPLICATIONS

The reported bill authorizes \$498,500,000 for the life and microgravity sciences and applications program aimed at using the space

environment to understand better the response of biological and materials systems to weightlessness. The authorized level will support continuation of NASA's ongoing research in the space biological, physical, and chemical sciences, and related work in technology development and applications. The life sciences and microgravity research conducted on Shuttle missions scheduled for fiscal year 1997 will provide a preview for the research planned for the International Space Station.

MISSION TO PLANET EARTH

The reported bill authorizes \$1,402,100,000 to fully fund Mission to Planet Earth, NASA's effort to employ the latest satellite technology to understand and predict the global climate trends that affect our daily lives. Mission to Planet Earth is NASA's contribution to the multiagency U.S. Global Change Research Program. The authorized amount assumes full funding for each of the program's main components, including the Earth Observing System (and Landsat), the Earth Observing System Data and Information System (EOSDIS), and Earth Probes.

The bill's authorization for Mission to Planet Earth also includes funding for two new university-led rural consortia. The Upper Missouri River Basin project would conduct hydrology studies in this flood-plagued region, and the Upper Midwest Aerospace Consortium project would convert satellite data for Mission to Planet Earth into useful information for the Upper Plains States region. Because of the importance of the EOSDIS to the successful collection, management, processing, and dissemination of the satellite data from Mission to Planet Earth, the bill expressly prohibits any downscaling or restructuring of the current baseline plan for EOSDIS without 60 days prior notification to the Senate Commerce and House Science Committees.

AERONAUTICAL RESEARCH AND TECHNOLOGY

The reported bill authorizes the full requested level of \$857,800,000 for NASA's Aeronautical Research and Technology program. This program is dedicated to ensuring U.S. leadership in aeronautics and promoting and facilitating the transfer of aeronautics technology to industry and government agencies such as the Department of Defense and the Federal Aviation Administration in order to promote better civilian and military aircraft and a safer national air space system. The authorized level will support continuation of the baseline program, including its subsonic, high-speed, and hypersonic research activities.

SPACE ACCESS AND TECHNOLOGY

The reported bill authorizes \$683,000,000 for Space Access and Technology, a decrease of \$42 million from the requested level. NASA's Space Access and Technology program is intended to stimulate the development of advanced space technologies to improve U.S. industrial competitiveness. Included within the authorization is the Reusable Launch Vehicle (RLV) program approved last year. The RLV program is aimed at developing and flight testing the technologies that may lead to the eventual development of a re-

placement of the Space Shuttle. Incorporated within the RLV effort are three separate but related experimental flight demonstrator programs: the DC-XA, the X-34 Small Reusable Launch vehicle, and the X-33 Advanced Technology Demonstrator. These activities will develop the key component technologies needed to make dramatic reductions in the cost of access to space. The bill also provides \$35 million for design and feasibility studies, as well as subsequent development and operations work, for a new radar satellite initiative. The bill's \$42 million reduction from the budget request for the Space Access and Technology account is based on the Committee's decision not to authorize the new Advanced Space Transportation Technology (ASTT) program, an activity proposed in the FY97 budget request that would develop advanced, high-risk technology to complement the RLV effort. The cut reflects the Committee's belief that some of the ASTT activities could be performed as part of either the RLV program or the Engineering and Technical Base program within the Office of Space Flight and that the tight budget climate precludes the authorization of any new starts for FY 1997.

MISSION COMMUNICATIONS SERVICES

The reported bill authorizes Mission Communications Services at the President's budget request of \$420,600,000. This authorized level will provide sufficient support for NASA's vast ground and space-based communications systems, which are essential to every NASA space mission.

ACADEMIC PROGRAMS

The reported bill authorizes NASA's Academic Programs at the President's budget request of \$100,800,000. NASA's Academic Programs have played an important role in sustaining U.S. academic achievement in mathematics and science and strengthening mathematics and science education at all levels, from pre-college through graduate school. This funding level should continue NASA's major activities in this account. Within that authorization, \$10 million are allocated for the Experimental Program to Stimulate Competitive Research (EPSCoR), a substantial increase over the budget request of \$4.5 million. NASA's EPSCoR is a critical source of funds for important academic space science research being conducted in our rural states. The authorization also allocates \$2 million for the science education and outreach project for the Upper Plains States region, for which NASA made a funding commitment in FY 1996.

SAFETY, RELIABILITY, AND QUALITY ASSURANCE

The reported bill authorizes the President's budget request of \$36,700,000 for the Safety, Reliability, and Quality Assurance programs, which are designed to develop and implement risk management practices throughout NASA.

SPACE COMMUNICATIONS SYSTEMS

The reported bill authorizes the full requested level of \$291,400,000 for NASA's Space Communications Systems. This ac-

count supports the tracking, telemetry, data acquisition, and data processing activities for all NASA spacecraft. Included among these activities is the Tracking and Data Relay Satellite (TDRS) program, which provides operational support for NASA and other domestic and international users of NASA's Space Network for space communications purposes. The authorization also supports the TDRS replenishment program to develop a new series of tracking satellites, the first of which is scheduled for launch in 1999.

RESEARCH AND PROGRAM MANAGEMENT

The reported bill authorizes \$2,078,800,000 for the Research and Program Management account at NASA. This account funds the salaries, travel expenses, and other administrative expenses for NASA's personnel. The authorization assumes funding for implementation of the buyout authority in the bill intended to encourage voluntary personnel separations to help implement workforce reductions with minimal use of reductions-in-force.

CONSTRUCTION OF FACILITIES

The reported bill authorizes the full requested level of \$163,600,000 for the Construction of Facilities account to fund the repair and upgrade of existing facilities and the construction of new facilities.

INSPECTOR GENERAL

The reported bill authorizes the President's budget request of \$17,000,000 for the Office of the Inspector General, which is a statutorily-created independent organization within NASA charged with investigating cases of fraud, waste, and abuse at the agency.

COMMERCIAL SPACE LAUNCH ACT AMENDMENTS

The reported bill makes changes in the organic act for the DOT's Office of Commercial Space Transportation to expand that agency's licensing authority to cover re-entry vehicles, re-entry sites, and in-space transportation. The bill also prohibits the Department of Transportation from issuing or transferring any license for the launch of a payload containing material to be used for obtrusive advertising in space.

ESTIMATED COSTS

In accordance with paragraph 11(a) of rule XXVI of the Standing Rules of the Senate and Section 403 of the Congressional Budget Act of 1974, the Committee provides the following cost estimate, prepared by the Congressional Budget Office:

U.S. CONGRESS,
CONGRESSIONAL BUDGET OFFICE,
Washington, DC, June 25, 1996.

Hon. LARRY PRESSLER,
Chairman, Committee on Commerce, Science, and Transportation
U.S. Senate, Washington, DC.

DEAR MR. CHAIRMAN: The Congressional Budget Office has prepared the enclosed cost estimate for S. 1839, the National Aeronautics and Space Administration Authorization Act, Fiscal Year 1997.

Enactment of S. 1839 would affect direct spending and receipts. Therefore, pay-as-you-go procedures would apply to the bill.

If you wish further details on this estimate, we will be pleased to provide them.

Sincerely,

JUNE E. O'NEILL, *Director.*

Enclosure.

CONGRESSIONAL BUDGET OFFICE COST ESTIMATE

1. Bill number: S. 1839.
2. Bill title: National Aeronautics and Space Administration Authorization Act, Fiscal Year 1997.
3. Bill status: As ordered reported by the Senate Committee on Commerce, Science, and Transportation on June 6, 1996.
4. Bill purpose: S. 1839 would authorize fiscal year 1997 appropriations for the National Aeronautics and Space Administration (NASA) and establish terms and conditions under which NASA could offer incentives to employees who voluntarily separate from federal service over the 1997–2000 period. The bill also would expand the scope of licensing of commercial space launch activities by the Office of Commercial Space Transportation (OCST) in the Department of Transportation (DOT) to include in-space transportation and reentry, launch and recovery sites, and space advertising.
5. Estimated cost to the Federal Government: As shown in the following table, S. 1839 would authorize appropriations totaling \$13.7 billion for 1997. CBO estimates that the employee separation incentives would affect direct spending over the 1997–2000 period, but the net budgetary impact over that period would not be significant. The impact on revenues of civil penalties under OCST's expanded licensing activities also would be insignificant.

[By fiscal year, in millions of dollars]

	1996	1997	1998	1999	2000	2001	2002
DIRECT SPENDING							
Spending under current law:							
Civilian retirement benefits:							
Estimated budget authority	39,120	41,146	43,067	45,057	47,062	49,149	51,316
Estimated outlays	39,041	41,064	42,980	44,967	46,968	49,051	51,214
Receipt of agency contributions:							
Estimated budget authority	– 15,702	– 16,164	– 16,627	– 16,883	– 17,616	– 18,255	– 19,128
Estimated outlays	– 15,702	– 16,164	– 16,627	– 16,883	– 17,616	– 18,255	– 19,128

(By fiscal year, in millions of dollars)

	1996	1997	1998	1999	2000	2001	2002
Proposed changes:							
Civilian retirement benefits:							
Estimated budget authority		4	8	4	(1)	(1)	(1)
Estimated outlays		4	8	4	(1)	(1)	(1)
Receipt of agency contributions:							
Estimated budget authority		- 8	- 8				
Estimated outlays		- 8	- 8				
Spending under S. 1839:							
Civilian retirement benefits:							
Estimated budget authority	39,120	41,150	43,075	45,061	47,062	49,149	51,316
Estimated outlays	39,041	41,068	42,988	45,971	46,968	49,051	51,214
SPENDING SUBJECT TO APPROPRIATIONS							
Spending under current law:							
Budget authority ²	13,905	365					
Estimated outlays	13,893	5,830	1,571	377	101		
Proposed changes:							
Estimated authorization level		13,703	29				
Estimated outlays		8,040	4,253	1,266	115	58	
Spending under S. 1839:							
Estimated authorization level ²	13,905	14,068	29				
Estimated outlays	13,893	13,870	5,824	1,643	216	58	

¹ Less than \$500,000.² The 1996 level is the amount appropriated for that year, the 1997 level includes an advance appropriation for National Aeronautical Facilities.

The costs of this bill fall within budget functions 250, 400, 600, and 950.

6. Basis of estimate: *Direct Spending*: The provisions in S. 1839 regarding separation incentives for NASA employees and civil penalties for violations of OCSST regulations would affect direct spending in fiscal years 1997 through 2002, but CBO estimates that the net impact over that period would not be significant.

Title III would allow NASA to offer separation incentive payments to employees from the date of enactment, assumed to be October 1, 1996, to the end of fiscal year 2000. Additional retirement costs would occur in the near term because some employees who retire under this program would receive their annuities earlier than they would otherwise. Expenditures for these annuities would constitute direct spending. This title also requires NASA to make additional payments to the Civil Service Retirement Trust Fund. Because these agency contributions increase offsetting receipts, the net impact on direct spending in fiscal year 1997 would be a reduction in outlays of \$4 million in 1999, resulting in a net change near zero over the next three years. We expect insignificant savings in years beyond 1999.

Based on projections from NASA, CBO estimates that about 1,700 employees would take a separation incentive payment and about 1,500 of those would retire. CBO assumes that half would take separation payments in 1997 and half in 1998. During NASA's previous separation incentive programs in 1994 and 1995, 2,647 employees took incentives. About 87 percent of employees taking

separation payments retired and 13 percent resigned. The expected number of incentive payments is less than before because NASA has not been hiring new employees and current employment levels are below its employment limit. This round of separation incentive payments, according to NASA, would be targeted to specific locations and occupations.

Based on retirement trends at NASA from 1990 to 1996, CBO expects that about 70 percent of the retirees taking incentives in 1997 and 1998 would retire anyway, without the incentive. This estimate assumes that the remaining 30 percent who accept the incentive would retire about one year earlier than they would have otherwise. Direct spending costs are estimated to be \$4 million in fiscal year 1997, \$8 million in 1998, and \$4 million in 1999. Beginning in 2000, insignificant savings would result because people who retire early accept an annuity that is lower than the one they would receive in the absence of an incentive.

This bill also would require NASA to contribute to the retirement trust fund a total of 15 percent of the final salary of all employees receiving a separation payment. Assuming an average salary of about \$60,000 in 1997 and \$62,000 in 1998, the estimated mandatory offsetting receipts would be \$8 million in fiscal year 1997 and another \$8 million in 1998.

Spending Subject to Appropriations: This estimate assumes that the full amounts authorized will be appropriated and that outlays will occur at rates consistent with recent trends for the agency. The bill specifies authorizations totaling \$13,703 million for NASA programs for 1997, which is about \$200 million below the agency's appropriation for fiscal year 1996.

Title III, which would allow NASA to provide separation incentive payments, would result in costs that would be funded by appropriations. The incentive payments made by NASA, estimated to be \$25,000 to each employee, would total about \$21 million in each of the years 1997 and 1998. The estimated cost of agency payments to the retirement trust fund of 15 percent of final salary for all employees taking a separation incentive is \$8 million annually in 1997 and 1998. Thus, Title III would increase NASA's costs by an estimated \$29 million in each of those years. The table shows the estimated authorization of \$29 million for fiscal year 1998. For 1997, we assume that those costs would be paid out of the amounts specifically authorized in the bill for that year. The use of voluntary separation incentives also could result in savings by allowing NASA to avoid the disruptive and expensive consequences of reductions-in-force. CBO cannot estimate these savings because the extent of future personnel reductions depends on funding levels over the next several years, which we cannot predict.

Revenues: S. 1839 could affect revenues but CBO estimates that any additional receipts from penalties associated with the OCSST licensing activities required by this bill would be insignificant. DOT has never collected a penalty for a violation of the licensing and related requirements of the commercial space transportation program.

7. Pay-as-you-go considerations: Section 252 of the Balanced Budget and Emergency Deficit Control Act of 1985 sets up pay-as-you-go procedures for legislation affecting direct spending or re-

ceipts through 1998. CBO estimates that enacting S. 1839 would affect direct spending and could affect receipts because of provisions regarding separation incentives for NASA employees and civil penalties for violations of the expanded OCST regulations. Therefore, pay-as-you-go procedures would apply to the bill, and the estimated impact is as follows:

[By fiscal year, in millions of dollars]

	1996	1997	1998
Change in outlays	0	-4	0
Change in receipts	0	0	0

8. Estimated impact on State, local, and tribal governments: S. 1839 contains no intergovernmental mandates as defined in Public Law 104-4. However, the bill would indirectly provide financial support to State and local governments. Currently, about \$800 million of NASA's budget goes to academic institutions, including public universities, for research and development projects. In addition, State and local governments are the beneficiaries of NASA's activities. For example, NASA's satellite images are used for land use planning and State and local government management. By reauthorizing NASA's programs, this assistance would continue.

The bill also would broaden the scope of the DOT's commercial space transportation program to include in-space transportation and reentry activities, rather than just launch activities. One of the purposes of this program is to facilitate the participation of state governments in the provision of space transportation infrastructure, such as launch sites. The Secretary of Transportation is required make excess launch property available to state governments. By broadening the scope of the program, the bill would enable states to receive additional assistance if they choose to participate.

9. Estimated impact on the private sector: Section 405 would impose new private-sector mandates related to license requirements for reentry sites as well as reentry and in-space transportation activities. In addition, section 419 would prohibit obtrusive space advertising. CBO estimates that the direct costs of private-sector mandates contained in S. 1839 would be negligible, and thus would not exceed the threshold cost of \$100 million during any of the first five years, as outlined in Public Law 104-4.

10. Previous CBO estimate: On April 30, 1996, CBO transmitted a cost estimate for H.R. 3322, the Omnibus Civilian Science Authorization Act of 1996, as ordered reported by the House Committee on Science on April 24, 1996. Title II of the House bill included an authorization of appropriations for NASA for fiscal year 1997 but did not include provisions related to incentives for NASA employees who voluntarily separate from Federal service. Differences between the estimate for Title II of that bill and the estimate for S. 1839 result from differences in the provisions.

11. Estimate prepared by: Federal cost estimate: Kathleen Gramp—NASA programs, Wayne Boyington—employee benefits; State and local government impact: John Patterson; Private-sector impact: Amy Downs.

12. Estimate approved by: Robert A. Sunshine, for Paul N. Van de Water, Assistant Director for Budget Analysis.

REGULATORY IMPACT STATEMENT

In accordance with paragraph 11(b) of rule XXVI of the Standing Rules of the Senate, the Committee provides the following evaluation of the regulatory impact of the legislation, as reported.

S. 1839, as reported, reauthorizes the programs and activities of the National Aeronautics and Space Administration for fiscal year 1997. The bill also contains amendments to the Commercial Space Launch Act, as amended, to extend the current licensing authority of the Office of Commercial Space Transportation of the Department of Transportation, which applies to commercial space launches and spaceports, to cover commercial reentry vehicles and reentry sites. It is the Committee's judgment that the bill will not subject any individuals or businesses affected by the bill to additional regulation, will not increase the paperwork requirement for such individuals or businesses, and will not have an adverse impact on individual privacy.

SECTION-BY-SECTION ANALYSIS

Section 1. Short title

This section permits the bill to be cited as the "National Aeronautics and Space Administration Act, Fiscal Year 1997".

Section 2. Definitions

This section defines "Administrator" and "NASA" for the purposes of the Act.

Title I—Authorization of Appropriations

Section 101. Human space flight

This section authorizes a total of \$5,354,600,000 for the Human Space Flight account allocated as follows:

- Space Station, \$1,802,000,000.
- Russian Cooperation, \$138,200,000.
- Space Shuttle, \$3,142,600,000.
- Payload and Utilization Operations, \$271,800,000.

SPACE STATION

The bill authorizes the full requested funding level of \$1,802,000,000 for the International Space Station program. The Space Station is by far NASA's most costly and complex program. The Space Station is aimed at constructing and operating an orbiting laboratory in space that will be used to conduct advanced materials research, study the effects of long-term human spaceflight, and perform other work requiring a near-zero gravity environment. While the U.S. has the lead role in this effort, major contributions are being made by the European Space Agency, Japan, and Canada. In addition, as part of the 1993 redesign of the Space Station, Russia was added as a Space Station partner to build and supply critical Station hardware and to fly hardware and supplies to the

Space Station. The bill's authorization should allow the Space Station to stay on schedule for the launch of its first element in 1997 and completion of the structure in 2002.

The authorization of full funding for the Space Station reflects the Committee's recognition of the program's importance to the future of the Nation's human space flight program. It also reflects the tremendous potential of the program to generate breakthrough scientific and technological discoveries, strengthen the Nation's technology base, and stimulate U.S. aerospace competitiveness. The Committee believes that it would not be in the public interest to abandon the Space Station program this close to the start of the assembly phase after so much time and money has been invested in it. To date, the U.S. has spent \$9 billion on the program and its foreign partners have contributed almost \$6 billion. This massive investment would be wasted if the program were cancelled at this time.

The Committee notes that, since the Space Station was first funded in 1984, the program has had a troubled history of chronic schedule slippages and cost overruns. Originally scheduled for completion in 1992 at a total cost of \$8 billion, the current plan calls for completion ten years after that date at a cost of \$30 billion. Through the years, the Space Station has undergone five redesigns, each resulting in further reduction of its scientific capabilities. In recent years, however, NASA has brought stability to the program's cost and structural design. The Committee expects NASA to continue to manage the program with tight cost controls and a firm commitment to its baseline plan and will be monitoring these matters closely as the program moves forward through its assembly phase.

In its oversight hearings over the last two years, the Subcommittee on Science, Technology, and Space has heard testimony from NASA and outside witnesses regarding Russia's involvement in the Space Station program. Russia was brought into the program to broaden its international base and to take advantage of Russia's decades of experience in human space flight and operations. The inclusion of Russian hardware should allow the U.S. to save money relative to earlier Space Station designs. The U.S.-Russian cooperation in the planned series of Shuttle-*Mir* missions has already proven its worth by paving the way for the upcoming assembly phase of the structure. However, the Committee remains concerned about the program's reliance on Russian contributions in almost every phase of its development. For example, according to the last publicly released assembly sequence, 44 of the 73 flights needed to assemble and service the Space Station will involve launches of Russian rockets from Russia, and the core of the Space Station will be a Russian-built navigation and propulsion system. The vulnerability of the Space Station program to this reliance on Russia was recently illustrated when the U.S. was forced to make several concessions to Russia's demands for reductions in its contributions to the program. In December 1995, the Russians proposed that the U.S. help extend the life of its existing space station (*Mir*) by attaching the early modules of the International Space Station (whose assembly begins in 1997) to the *Mir* space station. The baseline plan for the International Space Station assumed *Mir*

would be shut down as the new, and separate, International Space Station was begun.

The U.S. rejected this initial Russian proposal as totally disruptive of the baseline plan. Nevertheless, to accommodate the Russians, in February of this year, the U.S. negotiated a new agreement with the Russians under which the U.S. will add two additional resupply missions to *Mir* in 1998 (in addition to the seven previously scheduled through 1997) and use the Shuttle in 1999 to deliver to the Space Station a Russian power module that originally was to be launched by the Russians. The Russians offered nothing in exchange for these U.S. concessions. In the view of the Committee, this troubling episode raised serious concerns about (a) whether the Russians will make more demands for concessions in the program in the future and (b) whether the recent Russian demands are early warning signs that Russia may not have the money and launch capabilities to carry out its Station responsibilities. Although the Committee is aware that NASA has a viable contingency plan to permit the program to proceed in the event of a Russian withdrawal, there is little question that non-performance by the Russians would cause serious cost increases and schedule delays.

Finally, questions have been raised about whether the current Space Station design can even be executed. According to the Congressional Research Service, the current Space Station design will require 648 hours of spacewalking or extra-vehicular activity (EVA), 214 hours more than the previous design. In 1993, the Vest Committee, which was appointed by the Vice President to oversee NASA's redesign of the Space Station, reported: "EVA is an inherent risk to crew safety, and such heavy dependence on EVA threatens the success of station assembly." The Committee also noted that the Space Station's construction will require 73 launches to take place on time and in sequence within a 55-month period, an unprecedented demand on the launch resources of the U.S. and its foreign partners.

With the start of the Space Station assembly only one year away and 40 percent of its development completed, the Committee remains optimistic about the program and therefore has fully funded it in the bill. However, in light of the concerns referenced above, the Committee will closely monitor the progress of the Space Station to ensure that it remains within budget and on schedule and that it does not jeopardize NASA's other missions and programs.

RUSSIAN COOPERATION

The bill authorizes the full \$138,200,000 requested for the planned series of nine Shuttle missions to the Russian space station *Mir*, some of which already have been completed, to prepare for the assembly of the Space Station. These missions should increase the likelihood of Space Station's success by mitigating the risks in the design, assembly, and operation of the Space Station and paving the way for a harmonious working relationship with our newest Space Station partner, Russia.

SPACE SHUTTLE

The Space Shuttle account is authorized at the budget request of \$3,142,600,000. This funding level should enable NASA to maintain Shuttle performance without compromising safety. Over the next decade, America will rely on the Shuttle as never before as construction of the Space Station begins. Between 1997 and the year 2002, the Shuttle is scheduled to fly 24 missions to deliver parts and supplies to the Space Station. At the same time, the Shuttle program is facing intense pressure to cut costs. While the Committee applauds cost cutting, safety must always come first. As NASA reduces personnel to reduce costs, it must guard against taking shortcuts that would place our astronaut crews at risk. Accordingly, premature funding cuts in the Shuttle budget during this period must be avoided to ensure safe operations while preparing for the future private sector operation of the program.

To its credit, last year, NASA conducted several studies to examine responsible strategies for streamlining the Shuttle program. First, NASA issued a report on its internal review of the Shuttle program (the "Littles Report"). The Littles Report concluded that the Shuttle program's 35,000-person civil servant and contractor workforce could be reduced by 5,900 people without safety concerns. The Littles Report was followed by the issuance of another report (the "Kraft Report") which published the findings of an independent blue-ribbon panel chaired by former Johnson Space Center director Dr. Christopher Kraft. The Kraft Report made a number of recommendations, including that: (1) Space Shuttle operations should be placed under the control of one prime contractor with NASA's role reduced to top level oversight; (2) NASA should rely on current Shuttle hardware and software, with minimal modifications and upgrades; (3) Shuttle requirements should be reviewed with the goal of reducing requirements based on NASA's decades of experience with the Shuttle; (4) payload processing and integration should be streamlined; (5) operational contracts with contractors should be restructured to provide greater incentives to accomplish safe and successful missions; and (6) NASA should consider further industry involvement and progression toward the privatization of the Space Shuttle. Equally significant was the Kraft Report's general theme that safety concerns not be used to avoid consideration of ways to downsize the standing army of NASA personnel and the massive infrastructure that operate and maintain the Shuttle. The Kraft Report noted that NASA continues to operate the decades-old Shuttle as an experimental vehicle, changing 150 items of Shuttle hardware after each flight even though an average of only 10 in-flight (mostly inconsequential) problems per Shuttle mission typically occur. In that connection, the Committee commends NASA on its recent request that the Aerospace Safety Advisory Panel undertake a focused review of the Space Shuttle program, concentrating on the safety of the Shuttle in light of recent management and operational changes, workforce downsizings, planned Shuttle upgrades, and the higher Shuttle flight rates needed to build and support the Space Station.

PAYLOAD AND UTILIZATION OPERATIONS

The bill provides the requested level of \$271,800,000 for the programs under Payload and Utilization Operations. Among the activities under this account is Spacelab, a laboratory facility that is placed in the Space Shuttle payload bay to permit an expansion of the number and types of experiments that can be performed using the Shuttle. In its pressurized module configuration, the Spacelab has the added advantage of enabling astronauts to conduct research in the payload bay in a "shirt sleeves" environment. The authorization will also fund the payload integration account which provides the support needed for payload buildup, testing, and servicing, transportation to the Shuttle, payload integration and installation, and related launch activities. Also supported is the Advanced Projects program which manages projects aimed at improving ground and flight operations through new technologies and processes. The Advanced Projects program includes the Orbital Debris program aimed at improving the safety of the Space Shuttle and the planned Space Station by measuring, modeling, and mitigating orbital debris in space. With the explosive growth of government and commercial satellite systems, some employing hundreds of satellites, the Committee believes the need to regulate and track orbital debris will become an increasingly important space policy issue. Finally, the Engineering and Technical Base (ETB), which supports core technical capabilities, is also managed within the Payload and Utilization operations. The Committee urges that technology development work within the ETB that is focused on reducing the cost of boosting payloads to orbit be coordinated with the RLV effort in the Space Access and Technology program to complement and strengthen that related initiative.

Section 102. Science, aeronautics, and technology

This section authorizes a total of \$5,760,500,000 for Science, Aeronautics, and Technology allocated as follows:

Space Science, \$1,797,700,000.

Life and Microgravity Sciences and Applications, \$498,500,000.

Mission to Planet Earth, \$1,402,100,000.

Aeronautical Research and Technology, \$857,800,000.

Space Access and Technology, \$683,000,000.

Mission Communications Services, \$420,600,000.

Academic Programs, \$100,800,000.

SPACE SCIENCE

A. Physics and Astronomy. The bill's authorization assumes full funding for all of the space science activities devoted to physics and astronomy, including the Hubble Space Telescope (HST), the Advanced X-ray Astrophysics Facility (AXAF), and the Global Geospace Science (GGS) spacecraft. The authorization also supports continuation of the operations of HST, which has yielded remarkable scientific results since its repair in December 1993. AXAF, scheduled for launch in 1998, would be the third in NASA's series of Great Observatories. AXAF is aimed at examining a broad

range of the universe's electromagnetic spectrum. The GGS spacecraft are designed to perform measurements providing a better understanding of the interactions between the Sun and the Earth.

The bill also assumes support for continued development work on the Stratospheric Observatory for Infrared Astronomy (SOFIA) and planning for the Space Infrared Telescope Facility (SIRTF). SOFIA is a cooperative project with the German Space Agency to develop an infrared observatory for flight in a specially modified Boeing 747 airplane. Intended as a replacement for the Kuiper Airborne Observatory, SOFIA is expected to advance our knowledge and understanding of star and planet formation and the composition of the Universe. The bill supports continued planning and technology development related to SIRTF. SIRTF, planned for launch in the year 2002, would be the last of NASA's Great Observatories. SIRTF will use infrared technology to examine deep space in connection with advanced astrophysics studies.

The bill assumes no FY 1997 funding for Gravity Probe-B (GPB), for which \$59.6 million are allocated in the President's budget request. Begun in the 1960s, GPB is an effort to test Einstein's theory of relativity by flying gyroscopes in space. Thus far, NASA has spent more than \$240 million on GPB, without a single mission having ever flown, and it would require about \$300 million more to complete the project for a scheduled launch in the year 2002. In recent years, some segments of the scientific community have questioned the scientific value and feasibility of the program. In fact, over the years, GPB has undergone at least 17 studies to answer questions about its merit, the most recent of which was performed by the National Academy of Sciences last year. The President's budget request for FY 1996 indicated that, if the National Academy of Sciences study recommended funding GPB, NASA would have to find offsets in the budget to fund the program. At the March 1, 1995 hearing of the Subcommittee on Science, Technology, and Space on the NASA budget, NASA Administrator Goldin was asked, "If the latest National Academy of Sciences study does not find Gravity Probe-B to be a national priority, what do you think the possibilities of further funding in the program would be?" His response was, "Zero."

In May 1995, the Academy issued its comprehensive report on the GPB study. While the report recommended continuation of funding for GPB (on the strength of which it was funded for FY 1996), the overall text of the report was critical of the program. For instance, the report indicated that the panel was unable to reach a consensus on the relative value of GPB, but noted that it would likely have less impact on the scientific world than the Cosmic Background Explorer (COBE) satellite. The report further noted that the possibility of GPB producing "a great surprise" was "remote." The Committee also notes the skepticism expressed by some panel members that the project is even technically feasible. Finally, as fairly read, the report clearly did not view GPB as a national scientific priority. Since neither the Academy nor the broad scientific community it represents have so far given GPB their unqualified endorsements, the Committee believes the \$59.6 million for GPB would be better spent on cost reductions or other space science research.

B. Planetary Exploration. The bill assumes full funding for all of the Planetary Exploration programs in the budget submission, including the *Cassini*, Mars Surveyor, Discovery, and Explorer programs. The authorization will keep on schedule the *Cassini* mission to Saturn planned for launch in October 1997. The Mars Surveyor program, an exploration effort intended to achieve many of the goals of the failed Mars Observer Mission, would launch an orbiter to Mars in 1996 and launch another orbiter and a lander in 1998. The Discovery program is aimed at flying low-cost (\$150 million), focused missions concentrating on the inner solar system planets. Funding for the Discovery program will continue development of the Lunar Prospector and Stardust missions and support planning for future missions. Lunar Prospector will map the chemical composition of the Moon and study its magnetic and gravity fields. The Stardust mission, scheduled for 1999, will collect and return samples of interstellar dust for analysis.

The bill also assumes support for the New Millennium spacecraft program, a new start in FY 1996. This program, which is a cooperative effort between the Space Science and Space Access and Technology program offices, is intended to reduce the size and development times of scientific spacecraft, while increasing their capabilities. The Committee expects the New Millennium program managers to work in concert with their counterparts in the Mission to Planet Earth program and other federal remote sensing activities such as Landsat so those programs and activities might implement any technological advances and breakthroughs to reduce costs and increase capabilities. In that connection, the Committee asks that, within 60 days of the enactment of the bill, NASA submit to the Committee a strategic plan for how New Millennium will coordinate with and complement the activities of Mission to Planet Earth and other federal remote sensing programs.

LIFE AND MICROGRAVITY SCIENCES AND APPLICATIONS

The bill fully funds the Life and Microgravity Sciences and Applications account at \$498,500,000. This authorization will support NASA's ongoing study of the effects of weightlessness on humans and animals, as well as biomedical and materials research. NASA's life and microgravity sciences research will take on increasing importance when Space Station assembly begins in 1997. The program also supports the joint NASA/National Institutes of Health research in biotechnology, and the Committee encourages NASA to pursue similar research partnerships with other federal, state, academic, and private organizations.

MISSION TO PLANET EARTH

The bill authorizes the budget request of \$1,402,100,000 for Mission to Planet Earth, reflecting the Committee's strong endorsement of this activity. Mission to Planet Earth is a satellite program aimed at understanding and predicting global climate change by studying how the atmosphere, land, seas, and ice caps interact as a system. It is NASA's main contribution to the U.S. Global Climate Change Research Program and international climate change research programs. The bill assumes continued support for each of the program's components, including the Earth Observing System

(EOS), the EOS Data and Information System (EOSDIS), Landsat, and Earth Probes. The bill's authorization assumes the allocation of \$5 million for each of two university-led rural aerospace consortia that are authorized in Section 205 of the bill.

The central activity of Mission to Planet Earth is the development and launch of the EOS satellites. Beginning in 1998, NASA will launch several series of EOS satellites, each of which will carry multiple instruments measuring different aspects of climate change. The three main satellite series are: EOS—AM (scheduled for a 1998 launch); EOS—PM (scheduled for 2000); and EOS—CHEM (scheduled for 2002). Each series is designed to include up to three spacecraft that would be launched at up to 6-year intervals to permit climate change measurements over an 18-year period. The data from EOS will be collected, processed, and distributed by EOSDIS through its nine Distributed Active Archive Centers. Full funding for EOSDIS is essential if the huge volumes of data expected from EOS are to be properly distributed for the benefit of researchers, educators, government agencies, and other users of remote sensing satellite data around the Nation and the world.

The Landsat activity at NASA will continue support for development and launch in 1998 of the Landsat 7 satellite. For the last twenty years, the Landsat program has provided high-resolution satellite imagery of the Earth that has been used for climate and environmental research, land use planning, mineral exploration, and government missions. That imagery is archived at the Department of the Interior's Earth Resources Observation Systems (EROS) Data Center in Sioux Falls, South Dakota. The Landsat program currently relies on two aging satellites (Landsat 4 and 5). Because a 1993 effort to deploy Landsat 6 failed, the successful and timely deployment of Landsat 7 is critical to maintaining this national asset and its data continuity.

NASA's Earth Probes are smaller satellites designed to complement the larger EOS satellites by focusing on specific aspects of global change. They are also intended to take advantage of unique opportunities for international cooperation. The bill's authorization assumes funding for all of the Earth Probes activities in the budget request, including the Total Ozone Mapping Spectrometer, the Tropical Rainfall Measuring Mission, and Earth Systems Science Pathfinders.

The Committee believes Mission to Planet Earth is arguably NASA's most important and relevant mission, and it views any effort to eliminate the program or undermine it through inappropriate budget cuts, delays in planned satellite procurements, or unnecessary restructurings of the data management system as short-sighted and not in the public interest. Mission to Planet Earth is one of the few NASA programs that will yield clear, direct benefits to American taxpayers, rather than the speculative spinoff benefits often promised by other space activities.

In the Nation's agricultural states, many of which are represented on the Committee, the community's livelihood depends on weather and climate. Mission to Planet Earth may some day permit year-to-year climate prediction so farmers and ranchers would know in advance whether a particular year would bring floods, droughts, tornadoes, or other severe weather events. The program

may also help us determine the location and rate of ozone depletion, which poses a particular threat to our agricultural community. Mission to Planet Earth may eventually enable farmers, sitting in front of their personal computers, to access the Internet to obtain soil moisture data on the fields they are cultivating on almost a foot-by-foot basis. For years, the manufacturing industry has applied new technologies to operate with more precision and efficiency. Mission to Planet Earth may eventually give the agricultural community that same capability.

AERONAUTICAL RESEARCH AND TECHNOLOGY

The bill authorizes the requested level of \$857,800,000 for Aeronautical Research and Technology to fund all of the activities essential to the NASA's aeronautics mission requirements. The authorization level assumes full funding for all of the main aeronautics programs, including NASA's subsonic, supersonic, and hypersonic research programs. NASA's aeronautics program has been a major factor in maintaining U.S. leadership and industrial competitiveness in aerospace. The Committee also supports the program element devoted to the High Performance Computing and Communications Program (HPCC), including its Yohkoh Public Outreach Project (YPOP), a NASA-funded project that supports important educational and public outreach activities using scientific data collected under the Japan/U.S./United Kingdom Yohkoh solar physics mission.

NASA's aeronautics program is focused around six strategic goals: (1) to develop high-payoff technologies for a new generation of environmentally compatible, economically superior U.S. subsonic aircraft and a safe, highly productive global air transportation system; (2) to ready the technology base for an economically viable and environmentally friendly high-speed civil transport; (3) to develop the technology options for new capabilities in high-performance aircraft; (4) to develop and demonstrate technologies for hypersonic flight; (5) to develop advanced concepts, physical understanding, and theoretical, experimental, and computational tools to enable advanced aerospace systems; and (6) to develop and maintain critical national facilities for aeronautical research and for support of industry, FAA, DOD, and other NASA programs. In accordance with these goals, the aeronautics program is intended to maintain laboratory strengths and staff excellence; ensure timely domestic technology transfer; ensure strong university involvement; and ensure strong cooperation among NASA Research Centers, industry, and academia in a manner that uses the strengths of each partner.

The Committee continues to strongly support the NASA aeronautics research and technology program as a critical element of the success of the U.S. aerospace industry in the world market. Because of leading-edge aeronautical research conducted by NASA and NASA's work on emerging technologies, the U.S. aerospace industry is now one of the Nation's leading trade surplus industries. In order to maintain this positive balance of trade in the aerospace industries, the Committee has authorized the full funding for all essential NASA aeronautics activities.

The Committee strongly supports the NASA Research and Technology Base program that helps the U.S. lead in world aeronautical breakthroughs and advanced aviation concepts. The program should develop technologies for all flight regimes from subsonic (including rotorcraft) through hypersonic. The Research and Technology Base program includes disciplines of aerodynamics; propulsion and power; materials and structures; controls, guidance and human factors; and flight systems. The Committee encourages cooperative agreements with industry and other Government institutions, but recommends that NASA ensure a core competency in NASA personnel at the Research Centers. The emphasis of the program should be on efficiency, safety, and new capabilities. With regard to promising new cooperative efforts, the Committee encourages NASA to consider the formation of a cooperative arrangement with the Montana Avian Research Group. This group consists of several ornithological scientists whose research concentrates on four areas: Flight Dynamics, Signal Processing and Communications; Energetics and Physiology of Light; and Songbird Monitoring. Various academic, government, and private sector entities could potentially benefit from the commercially relevant technologies that this research might generate. The Committee also continues to support strongly NASA's research in hypersonic flight, particularly the work on hydrodynamics technologies.

SPACE ACCESS AND TECHNOLOGY

The bill authorizes \$683,000,000 for the Space Access and Technology account to continue current programs and new activities. This funding level will support NASA's ongoing work in spacecraft and remote sensing, technology development, advanced space transportation, flight programs, space communications, and technology transfer. The bill assumes funding for the radar satellite activities authorized in Section 203 of the bill. Radar satellite technology holds the promise of taking conventional optical-based remote sensing capabilities like Landsat to the next level. Optical-based satellites cannot see through cloud cover so they often must wait for clear skies to obtain the desired imagery. Radar satellites do not labor under that constraint. Because radar satellites employ radio waves to generate their images, radar satellites are unhampered by cloud cover or nightfall. For rural states, radar satellites hold special interest since they can provide data about soil moisture, crop and vegetation classification and health, and the water content of snow. In addition, radar satellites can reveal elevation data, which can be integrated with current Landsat data to provide three-dimensional Earth images. Equally exciting, when these satellites are flown as clusters, they can measure ground movements of as little as one centimeter, producing data of enormous benefit to seismologists in understanding and predicting earthquakes around the world. The applications of this technology seem truly limitless. This fact is not lost on Japan, Europe, and Canada, all of which operate radar satellites. The Committee urges NASA to make the development of quality civilian radar satellite capabilities an agency priority beginning in FY 1997 and continuing thereafter.

The bill also assumes continued support for the Technology Transfer and Commercialization Center for the Rocky Mountains

and Upper Plains States region, to which NASA committed funding this year. This center would be the first to serve that region. States in this region now have to work with a facility in Texas, which cannot adequately understand and meet the special needs of that region. The new center would focus on the unique interests and requirements of the region where there are often great distances between businesses and 98 percent of the companies have 50 or fewer employees. The new center would be located at Montana State University (MSU). The Committee is confident that MSU possesses the requisite experience, skills, resources, and outreach capabilities to serve the interests of the region and could draw on the existing Burns Telecommunications Center in Bozeman, Montana, for assistance in delivering programs and materials to the community.

The bill assumes full funding for NASA's RLV initiative to develop and flight test technologies that might lead to a privately developed and operated reusable space transportation system to replace the Space Shuttle in the next century. The bill assumes full funding for each of the technology demonstrator vehicle activities, including: the single-stage-to-orbit test vehicle, the X-33; a smaller launch vehicle, the X-34; and the ground and flight testing of the DC-XA (an upgrade of the DOD's successful DC-X test vehicle).

The cost of putting useful cargo into low Earth orbit currently ranges from \$3,000 per pound of payload to the Space Shuttle's \$15,000 per pound cost. These high costs have kept this Nation from doing more in space, and, until access to orbit is made easier and less expensive, the U.S. will not be able to take full advantage of the scientific and commercial opportunities of space.

The goal of the RLV program is to demonstrate cheap, reliable, frequent access to space through cooperative efforts with industry to develop experimental vehicles to test new approaches to spaceflight. The Committee notes this is an implementation of the President's August 4, 1994, National Space Policy (PDD/NSTC-4), which calls for a "flight demonstration which would prove the concept of single-stage-to-orbit." One of the strengths of experimental vehicles, like the X-33, X-34, and DC-XA vehicles, is their focus on the development and demonstration of technologies, rather than on the accomplishment of operational mission goals.

The Committee commends NASA's commitment to do business in new ways, as exemplified by its intention to require significant financial participation by its RLV contractors, as well as its decision to allow industry to take the lead in designing the X-33 and X-34. However, in conducting business differently, some new legal issues have arisen regarding the third-party liability of the contractors involved with the development and operation of the experimental vehicles in the program. The aerospace industry has raised valid legal questions about whether, under current law, its third-party liability can be restricted to an acceptable level. Until these questions are resolved, industry might be reluctant to move to the flight test phase of any of the RLV planned activities. To address this matter, the Committee requests that, within 60 days of the enactment of this bill, NASA submit to the Committee a report that identifies the major legal and policy issues relating to the third-party liability and indemnification of contractors involved in RLV work, as well as any other issues NASA deems relevant, and that

recommends possible options (including schedules) for resolving these issues in a manner which is satisfactory to NASA and the contractor community, but which also promotes the public interest.

The Committee stresses the ultimate goal of NASA's RLV program is to provide proven, demonstrated technologies enabling the private sector to build and fly single-stage-to-orbit RLVs. In the case of the X-33 activity, there is the additional expectation of the development of an RLV capable of replacing the Shuttle in the next decade. In this budget environment, the federal government cannot afford to pay the more than \$6 billion in estimated development costs for a Shuttle replacement vehicle. In its support for the RLV, the Committee assumes that any effort to build a Shuttle replacement will require industry to share approximately 10 to 20 percent of the development costs. However, industry will not be disposed to share financing responsibilities if the vehicle concepts do not meet the commercial needs of its customers. On that point, the Committee is aware of concerns within the aerospace industry that the performance requirements for the X-33 vehicle are too closely biased toward the goal of replacing the Shuttle. The Committee's approval of the proposed RLV program assumes that NASA will take immediate steps to resolve this problem so the program continues to remain focused on the goal of producing a vehicle that will both satisfy government needs and respond to commercial market requirements.

The authorization assumes funding for the Centers for the Commercial Development of Space (CCDSs). The Committee is concerned that the funding for this activity not evolve into an entitlement. The CCDSs were originally established to promote the development of new products using the unique microgravity environment of space. The Centers were expected to increase U.S. business participation and investments in space-linked commercial goods and services in order to benefit the U.S. industries involved and the economy as a whole. The idea was that federal funds would be used in the early stage of a Center's existence as "seed money" until the Center could support itself with money from non-federal funding sources. In 1993, NASA phased out support for 6 of the 17 Centers; however, the FY 1997 budget request assumes a contribution by the agency of approximately \$18 million to the remaining 11 Centers. Current budget realities require NASA take aggressive steps to move each of the remaining Centers to self-sufficiency so its federal support does not evolve into an entitlement. In that connection, the Committee requests that NASA submit to the Committee by April 1, 1997, a strategic plan for ending federal support for each Center which includes intermediate targets and timetables for achieving that end. The Committee further requests that such plan include an assessment of the current economic viability of each Center. Finally, the Committee requests that, in all future budget submissions to Congress, beginning with the submission for FY 1998, the total funding for the CCDSs, as well as the funding for each Center, be clearly identified.

The Committee urges NASA to develop policies and manage its programs and activities in a manner that promotes, rather than frustrates, the U.S. commercial space industry. In that connection, the Committee notes its concern about the failure of NASA and the

U.S. Air Force to develop and implement a common pricing policy for launch property and launch services provided to the commercial space industry and state governments. Accordingly, the Committee requests that the two agencies develop and implement a common pricing policy without further delay and submit a report regarding that policy to the Committee no later than March 1, 1997. The Committee is also concerned about NASA's interpretation of direct costs which are charged to the commercial space industry and state governments. The House of Representatives legislative history of the Commercial Space Launch Amendments of 1988 indicates the intent that direct costs are based on additive costs, which would seem to preclude the government from charging for the salaries of existing government and contractor personnel as well as equipment use fees. The Committee directs NASA to correct immediately its interpretation of direct costs to make it consistent with the legislative history of the 1988 legislation and to submit a report to the Committee regarding its corrections no later than January 1, 1997.

MISSION COMMUNICATIONS SERVICES

The bill authorizes the requested level of \$420.6 million for Mission Communications Services. Mission Communications Services manages the provision of telecommunications services needed to support NASA's exploration, science, and research and development programs. This authorization will enable this activity to continue at the level required to meet mission goals.

ACADEMIC PROGRAMS

The bill authorizes the requested level of \$100.8 million for NASA's Academic Programs. This activity is aimed at enhancing scientific and technological competence through a broad range of educational outreach activities addressed to both pre-college and higher education. Of the authorized amount, \$2 million is allocated for NASA's continued assistance to the Upper Plains States regional science education and outreach center project and assumes continued support for the establishment of a new Rural Teacher Resource Center to serve that underserved region.

The funding for the science education and outreach center would support the Science Discovery Center project presently under development in Sioux Falls, South Dakota. Currently, the Sioux Falls community is working diligently to convert an unused high-school facility into a high-tech center that would be used to enhance and expand the educational experiences at the K-12 level and to increase the knowledge and understanding of the entire community and region of science and technology. Once completed, the Center would be the only facility of its kind in the region. The Center has broad support in the local community, which is currently financing the ongoing development work on the project.

This year, NASA is expected to begin work on a new Rural Teacher Resource Center, which would be the tenth NASA Teacher Resource Center (TRC). The TRCs maintain a collection of NASA-related materials and make them available to the communities they serve. Each of the current TRCs is located at a NASA field center. While the prior policy of co-locating the TRCs at NASA facilities is understandable, it has meant that those in the Plains

States region have not been served by the TRCs. The establishment of an additional Rural TRC should rectify this problem. The new Rural TRC will be located at Montana State University, whose location, knowledge of the area, and outreach capabilities uniquely qualify it to manage the TRC in a way that will serve the special needs of the entire region.

In order to increase the effectiveness of NASA's academic programs, the Committee encourages NASA to work with non-profit organizations to enhance the development of aerospace education programs through state-based teacher outreach. The goals of such partnerships should include streamlining the administration of NASA's education programs, stimulating state participation in the civilian space program, evolving the role of aerospace science in the classroom, and supporting teacher training in aerospace science. The Committee believes space education is important to the Nation and encourages efforts like those of the Spaceweek International Association, which holds an annual event involving government, industry, and education organizations across the United States to educate the public about space. The Committee supports these kinds of initiatives and recommends scheduling them during the school year to maximize student participation and stimulate student interest in mathematics and science.

Section 103. Mission support

This section authorizes a total of \$2,570,500,000 for Mission Support allocated as follows:

- Safety, Reliability, and Quality Assurance, \$36,700,000.
- Space Communications Services, \$291,400,000.
- Research and Program Management, \$2,078,800,000.
- Construction of Facilities, \$163,600,000.

SAFETY, RELIABILITY, AND QUALITY ASSURANCE

The bill authorizes the requested level of \$36,700,000 for NASA's safety, reliability, and quality assurance programs. This activity funds NASA's safety oversight of all of its missions and programs. The funding reflects the importance the Committee places on NASA's safety-related functions.

SPACE COMMUNICATIONS SERVICES

The bill authorizes \$291,400,000 for Space Communications Services (the President's budget request). This account funds the tracking, telemetry, data acquisition, and data processing activities for all NASA spacecraft. Included among these activities is NASA's Tracking and Data Relay Satellite (TDRS) system of geosynchronous satellites and its associated ground stations. Some Members of the Committee have urged NASA, to the extent practicable and consistent with its mission, to continue to work with educational programming providers to explore ways that they might use available unused C-band transponder space on the TDRS satellites. At an April 24th hearing before the Subcommittee on Science, Technology, and Space on distance learning, witnesses testified about the prohibitive cost and scarcity of the transponder space commercially available to the educational community. The Committee supports appropriate and cost-effective efforts by NASA to help that

community address these obstacles to the satellite-based delivery of educational programming in order to enhance and strengthen our Nation's mathematics and science educational activities at all levels.

RESEARCH AND PROGRAM MANAGEMENT

The bill authorizes the full requested level of \$2,078,800,000 for Research and Program Management, the account which funds the salaries, travel expenses, and other administrative expenses at NASA. The Committee believes this funding level will be sufficient to fund the implementation costs of the buyout provisions contained in Title III of the bill to encourage voluntary separations in order to reduce the agency's workforce.

CONSTRUCTION OF FACILITIES

The bill authorizes the requested level of \$163,600,000 for Construction of Facilities. This account funds the various projects requested by NASA involving the repair and renovation of existing facilities and the design and construction of new facilities.

Section 104. Inspector General

This section authorizes the requested \$17,000,000 for NASA's Office of Inspector General (OIG). The OIG conducts audits, inspections, and investigations to assist NASA to achieve efficiency and effectiveness in the administration of its programs and to prevent and detect fraud, waste, and abuse. The OIG's role is particularly critical in the area of procurement since about 90 percent of the agency's total obligations are for procurement. In recent years, the OIG has been criticized for failing to maintain the level of independence from the agency management that was contemplated under the Inspector General Act. In certain cases, that failure may well have compromised the effectiveness and integrity of the OIG's investigations and undermined staff investigators. In a February 1994 report, the GAO released the results of its investigation into allegations of misconduct by the individual serving as Inspector General at that time. The GAO reviewed allegations in three areas: (1) prenotification of senior NASA employees who were targets of impending OIG investigations; (2) unauthorized disclosure of grand jury-related information; and (3) premature closing of selected audits and investigations. The GAO found no support for allegations in the last two categories; however, with regard to the "prenotification" charge, the GAO found the then-Inspector General's practice appeared to constitute "a failure to exercise due professional care and could be viewed as an impairment of his office's execution of investigations." The Committee expects the OIG to adopt appropriate policies and guidelines to ensure against a repeat of this practice.

Title II—Limitations and General Provisions

Section 201. Space Station limitation

This section limits the total authorization for Space Station and related activities in fiscal year 1997 to \$2,100,000,000. However, in order not to disrupt the planned Space Station effort, the Committee expects to work with the Administration prior to floor consideration of the bill to ensure an authorized level of \$2,148,600,000 for Station-related activities is available to NASA for FY 1997. At the inception of the Space Station *Alpha* concept, NASA and the Administration made a firm commitment to the total development cost of \$17.4 billion for the assembly phase beginning in 1997 and ending in 2002, based on the assumption of stable funding throughout that period. In FY 1997, a peak year of productivity in the program, \$2.148 billion is required to meet that commitment for FY 1997. The Committee accepts this and will work to make an appropriate adjustment to the Space Station authorization when the Senate considers the bill.

Section 202. Experimental program to stimulate competitive research

This section authorizes \$10,000,000 within NASA's Academic Programs account to the existing EPSCoR program which funds space research in rural states. The Committee commends NASA's EPSCoR on its vital funding support for quality space science research at rural academic institutions and encourages the agency to form cooperative relationships between EPSCoR and NASA's space science programs to further enhance the competitiveness of those institutions.

Section 203. Radar remote sensing satellites

This section authorizes \$35,000,000 for Phase A and B studies for a radar satellite program and any subsequent development and operational activities. Earlier this year, at the urging of the Committee and pursuant to the FY 1996 appropriations legislation for NASA, the agency announced its commitment to conducting Phase A studies for this initiative. This section authorizes that work, as well as any follow-on activities relating to a new civilian radar satellite initiative. This section requires NASA to submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science of the House of Representatives an implementation plan within 90 days of the enactment of the bill. At a time when three other nations operate radar satellite systems, the Committee believes it is in the national interest for NASA to develop an operational radar satellite system for the U.S. The radar satellite program would complement and strengthen the capabilities of our current remote sensing assets and generate benefits for industry, academia, and the government. The Committee requests this new radar satellite be coordinated with Mission to Planet Earth, any reflights of the Shuttle Imaging Radar-C or similar follow-on spacecraft, and other civilian remote sensing activities at NASA or other government agencies.

Section 204. Restructuring of the Earth Observing System Data and Information System

This section prohibits NASA from restructuring the data management portion of the Mission to Planet Earth program unless the Senate Committee on Commerce, Science, and Transportation and the Committee on Science of the House of Representatives are given 60 days notice of the proposed action, so that those oversight Committees are informed of the nature, cost, and program impact of any such proposed action. The Committee supports the baseline plan for Mission to Planet Earth, particularly its data management component, the Earth Observing System Data and Information System (EOSDIS). Through its network of regional Distributed Active Archive Centers (DAACs), EOSDIS will collect and process an unprecedented volume of satellite data and distribute that data to over 100,000 users in business, education, agriculture, and the general public.

Section 204 is intended to address the Committee's serious concerns about possible attempts to restructure EOSDIS to the detriment of the system. The Committee notes that, in its oversight hearings this year, both on the FY 1997 NASA budget and on Mission to Planet Earth in particular, some members of the Committee expressed reservations about the serious adverse effects that any EOSDIS restructuring could have on the success of the Earth Observing System satellite program as it nears the launch of its first spacecraft (AM-1) in 1998 and the precursor SeaStar mission in 1997. While the Committee respects the recommendations of last fall's National Research Council report on Mission to Planet Earth, it does not agree with its specific recommendation to proceed immediately to a "federated management" approach of EOSDIS. It believes such a concept is ill-advised at this time and could lead, however unintentionally, to a kind of management by committee, with negative schedule, budgetary, and technical consequences as a result. To the extent any such concept is implemented, it could be limited to a narrowly focused pilot program so that the core data activities of EOSDIS managed by the DAACs are not placed at risk.

Section 205. Rural aerospace consortia to develop applications for Mission to Planet Earth data

This section authorizes \$5,000,000 for a university-led consortium to conduct hydrology research focused on the Upper Missouri River Basin region, and another \$5,000,000 for the efforts of the Upper Midwest Aerospace Consortium to make Mission to Planet Earth data more accessible by the general public. The hydrology studies project will conduct research on the hydrology of the flood-plagued Upper Missouri River Basin. The project will use the enormous volumes of data from Mission to Planet Earth for research to inform public policy decisions relating to the Upper Missouri River Basin. The research will focus on a broad range of subjects, including: the development of better management and investigation of floods and natural disasters; the impact of natural events and water management on the food-producing capabilities of the region; and the development of models for hydrology research and water management policy which can be transferred to other large river

basins around the world. The project would be managed by a broad consortium of regional academic, government, and private sector institutions led by the South Dakota School of Mines and Technology, which has a distinguished track record in the area of hydrology research and development. The Upper Midwest Aerospace Consortium will concentrate on converting the data from Mission to Planet Earth into useful information that is understandable and accessible by individuals and institutions in the region. To further broaden the utility of Mission to Planet Earth data, the Committee encourages NASA to consider entering into cooperative research arrangements with entities like the Flathead Lake Biological Station. Flathead Lake is the largest natural, fresh-water lake west of the Mississippi River. Participation by NASA in the research being conducted by this facility would greatly enhance its ongoing hydrological and biological studies of the lake and the surrounding region.

Section 206. Acquisition of Earth remote sensing data

This section authorizes NASA, to the extent feasible and cost-effective, to acquire Earth remote sensing data and services from the private sector when these data are found to fulfill the science requirements of Mission to Planet Earth and authorizes \$50,000,000 within the Mission to Planet Earth account for such purchases.

Section 207. Shuttle privatization

This section directs NASA to conduct a study of the feasibility of Shuttle privatization and to report to the Senate Committee on Commerce, Science, and Transportation and the Committee on Science of the House of Representatives on the findings of that study within 60 days of the enactment of the legislation. This section directs NASA to conduct a feasibility study of the major recommendation of its own independent review team (the Kraft commission) that the Space Shuttle program be privatized. The study would look at all the main policy and legal issues that must be resolved before NASA could responsibly proceed toward privatization. Within 60 days of the enactment of the bill, NASA is required to complete the study and submit a report thereon to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Science of the House of Representatives. Allowing a private company to manage and operate the Shuttle on a commercial basis would save the taxpayer much of the \$3 billion per year the program now costs. The Committee commends NASA on its placement of the program under one prime contractor as a transitional step toward the ultimate goal of full privatization.

Section 208. Use of existing facilities

This section directs NASA to consider, prior to committing to the purchase, lease, or expansion of a facility to meet agency requirements, the use of military facilities that have been closed or are being closed, as well as underutilized military or other Federal agency facilities, for such requirements to the extent feasible, cost-effective, and not inconsistent with the Defense Base Closure and Realignment Act of 1990. The end of the Cold War and the drawdown of our military infrastructure has left the Nation with

many facilities and property that are unused or woefully underutilized. In many of the states represented on the Committee, there are easily identifiable military and other federal government facilities that might be put to some cost-effective use in our U.S. space program. Ellsworth Air Force Base in South Dakota and Malmstrom Air Force Base in Montana are just two examples of military installations that the space program might put to good use. Section 208 is intended to encourage NASA to start taking a serious look at using some of these valuable assets and properties that have served as the backbone of our national defense and federal government before making huge financial commitments to new leases or purchases of facilities.

Section 209. Use of funds for construction

This section authorizes NASA to use funds appropriated for purposes other than Construction of Facilities, Research and Program Management (excluding research operations support), and the Office of Inspector General for the construction of new facilities and modifications to existing facilities, provided, however, that no funds used under this section may be spent for a project whose estimated cost exceeds \$750,000 until 30 days have passed after notice has been given to the Senate Committee on Commerce, Science, and Transportation and the Committee on Science of the House of Representatives of the nature, location, and estimated cost of the project.

Section 210. Construction of facilities

This section authorizes the reprogramming of funds appropriated for construction of facilities for the construction, expansion, or modification of facilities at any location if NASA determines the reprogramming was dictated by new developments in aeronautics and space activities, and deferral of such action until the next authorization Act would be inconsistent with the national interest in aeronautics and space activities, provided that 30 days' notice has been given to the Senate Committee on Commerce, Science, and Transportation and the Committee on Science of the House of Representatives.

Section 211. Availability of appropriated amounts

This section provides that, to the extent provided in appropriations Acts, appropriations authorized under the bill may remain available without fiscal year limitation.

Section 212. Consideration by Committees

This section provides that no appropriated funds may be used for any program deleted by the Congress from requests originally made to the Senate Committee on Commerce, Science, and Transportation and the Committee on Science of the House of Representatives, and no funds may be used for any program in excess of the amount actually authorized for that particular program (exclusive of construction of facility projects) unless 30 days have passed after proper notification to those Committees.

Section 213. Use of funds for scientific consultations or extraordinary expenses

This section authorizes the use of funds not to exceed \$35,000 for official reception and representation expenses.

Section 214. Reporting requirements

This section eliminates the requirement of an annual President's report on aeronautics and space which is deemed unnecessary and too costly, and permits NASA to delay for up to five years the disclosure of commercially valuable information generated in programs funded in whole or in part by NASA. It also requires NASA to publish biannually a list of all competitively sensitive technology areas important to aeronautical and space leadership or competitiveness.

Section 215. Independent research and development

This section indicates that Congress finds that contractors should be allowed to recover as independent research and development costs the costs they contribute in cooperative agreements with NASA.

Section 216. Reduction or suspension of contract payments based on substantial evidence of fraud

This section gives NASA the same authority possessed by DOD and other civilian agencies to withhold contract payments based on substantial evidence of fraud.

Section 217. Educational activities

This section requires NASA to develop, no later than July 31, 1997, a strategic plan for those educational activities based on the human exploration of space and specifically the International Space Station program.

Title III—Employment Reduction Assistance

Sections 301–310

This title, developed in consultation with NASA, provides the agency with up to \$25,000 per employee in buyout authority to provide separation incentives for its personnel to assist the agency's efforts to downsize its workforce with minimal use of reductions in force. The Committee understands and recognizes the need for NASA to reduce its 25,000-person workforce to approximately 17,000 workers by the year 2000. Nevertheless, it believes such personnel reductions need to be implemented in a gradual and thoughtful manner, with proper consideration for the personnel affected. It is with that in mind that the Committee has provided this authority through fiscal year 2000 to encourage voluntary separations in support of NASA's downsizing effort.

Title IV—Commercial Space Launch Act Amendments

Sections 401–419

This title amends the Commercial Space Launch Act, as amended, to extend the current licensing authority of the DOT Office of Commercial Space Transportation (OCST) to cover re-entry space vehicles, reentry sites, and in-space transportation and directs OCST to issue regulations to implement those amendments. Under current law, OCST is only authorized to license U.S. commercial launches and launch facilities. Commercial reentry vehicles and sites and in-space transportation activities were not contemplated when the current regulatory regime was established. This expansion of licensing authority is critical to ensure that these new emerging commercial space activities are safe and are covered by the risk allocation regime established under the current law to limit third party liability associated with commercial launches. This title also establishes a requirement for DOT to provide an annual report to Congress on the activities of OCST. It also prohibits OCST from issuing or transferring licenses for the launch of payloads to be used for obtrusive space advertising, and asks the President to negotiate with other foreign space launching nations to reach an agreement that would prohibit the use of outer space as a medium for obtrusive advertising purposes. However, this provision is not intended to prohibit on-vehicle advertising such as that found on racing cars.

CHANGES IN EXISTING LAW

In compliance with paragraph 12 of rule XXVI of the Standing Rules of the Senate, changes in existing law made by the bill, as reported, are shown as follows (existing law proposed to be omitted is enclosed in black brackets, new material is printed in *italic*, existing law in which no change is proposed is shown in roman):

TITLE 10—ARMED FORCES

Subtitle A—General Military Law

PART IV—SERVICE, SUPPLY, AND PROCUREMENT

CHAPTER 137—PROCUREMENT GENERALLY

§ 2307. Contract financing

- (a) **PAYMENT AUTHORITY.**—The head of any agency may—
 - (1) make advance, partial, progress, or other payments under contracts for property or services made by the agency; and
 - (2) insert in solicitations for procurement of property or services a provision limiting to small business concerns advance or progress payments.
- (b) **PERFORMANCE-BASED PAYMENTS.**—Whenever practicable, payments under subsection (a) shall be made on any of the following bases:

(1) Performance measured by objective, quantifiable methods such as delivery of acceptable items, work measurement, or statistical process controls.

(2) Accomplishment of events defined in the program management plan.

(3) Other quantifiable measures of results.

(c) PAYMENT AMOUNT.—Payments made under subsection (a) may not exceed the unpaid contract price.

(d) SECURITY FOR ADVANCE PAYMENTS.—Advance payments made under subsection (a) may be made only if the contractor gives adequate security and after a determination by the head of the agency that to do so would be in the public interest. Such security may be in the form of a lien in favor of the United States on the property contracted for, on the balance in an account in which such payments are deposited, and on such of the property acquired for performance of the contract as the parties may agree. This lien is paramount to any other liens and is effective immediately upon the first advancement of funds without filing, notice, or any other action by the United States.

(e) CONDITIONS FOR PROGRESS PAYMENTS.—

(1) The Secretary of Defense shall ensure that any payment for work in progress (including materials, labor, and other items) under a defense contract that provides for such payments is commensurate with the work accomplished that meets standards established under the contract. The contractor shall provide such information and evidence as the Secretary of Defense determines necessary to permit the Secretary to carry out the preceding sentence.

(2) The Secretary shall ensure that progress payments referred to in paragraph (1) are not made for more than 80 percent of the work accomplished under a defense contract so long as the Secretary has not made the contractual terms, specifications, and price definite.

(3) This subsection applies to any contract in an amount greater than \$ 25,000.

(f) CONDITIONS FOR PAYMENTS FOR COMMERCIAL ITEMS.—

(1) Payments under subsection (a) for commercial items may be made under such terms and conditions as the head of the agency determines are appropriate or customary in the commercial marketplace and are in the best interests of the United States. The head of the agency shall obtain adequate security for such payments. If the security is in the form of a lien in favor of the United States, such lien is paramount to all other liens and is effective immediately upon the first payment, without filing, notice, or other action by the United States.

(2) Advance payments made under subsection (a) for commercial items may include payments, in a total amount of not more than 15 percent of the contract price, in advance of any performance of work under the contract.

(3) The conditions of subsections (d) and (e) need not be applied if they would be inconsistent, as determined by the head of the agency, with commercial terms and conditions pursuant to paragraphs (1) and (2).

(g) CERTAIN NAVY CONTRACTS.—

(1) The Secretary of the Navy shall provide that the rate for progress payments on any contract awarded by the Secretary for repair, maintenance, or overhaul of a naval vessel shall be not less than—

(A) 95 percent, in the case of a firm considered to be a small business; and

(B) 90 percent, in the case of any other firm.

(2) The Secretary of the Navy may advance to private salvage companies such funds as the Secretary considers necessary to provide for the immediate financing of salvage operations. Advances under this paragraph shall be made on terms that the Secretary considers adequate for the protection of the United States.

(3) The Secretary of the Navy shall provide, in each contract for construction or conversion of a naval vessel, that, when partial, progress, or other payments are made under such contract, the United States is secured by a lien upon work in progress and on property acquired for performance of the contract on account of all payments so made. The lien is paramount to all other liens.

(h) ACTION IN CASE OF FRAUD.—

(1) In any case in which the remedy coordination official of an agency finds that there is substantial evidence that the request of a contractor for advance, partial, or progress payment under a contract awarded by that agency is based on fraud, the remedy coordination official shall recommend that the head of the agency reduce or suspend further payments to such contractor.

(2) The head of an agency receiving a recommendation under paragraph (1) in the case of a contractor's request for payment under a contract shall determine whether there is substantial evidence that the request is based on fraud. Upon making such a determination, the agency head may reduce or suspend further payments to the contractor under such contract.

(3) The extent of any reduction or suspension of payments by the head of an agency under paragraph (2) on the basis of fraud shall be reasonably commensurate with the anticipated loss to the United States resulting from the fraud.

(4) A written justification for each decision of the head of an agency whether to reduce or suspend payments under paragraph (2) and for each recommendation received by such agency head in connection with such decision shall be prepared and be retained in the files of such agency.

(5) The head of an agency shall prescribe procedures to ensure that, before such agency head decides to reduce or suspend payments in the case of a contractor under paragraph (2), the contractor is afforded notice of the proposed reduction or suspension and an opportunity to submit matters to the head of the agency in response to such proposed reduction or suspension.

(6) Not later than 180 days after the date on which the head of an agency reduces or suspends payments to a contractor under paragraph (2), the remedy coordination official of such agency shall—

(A) review the determination of fraud on which the reduction or suspension is based; and

(B) transmit a recommendation to the head of such agency whether the suspension or reduction should continue.

(7) The head of an agency shall prepare for each year a report containing the recommendations made by the remedy coordination official of that agency to reduce or suspend payments under paragraph (2), the actions taken on the recommendations and the reasons for such actions, and an assessment of the effects of such actions on the Federal Government. The Secretary of each military department shall transmit the annual report of such department to the Secretary of Defense. Each such report shall be available to any member of Congress upon request.

(8) This subsection applies to the agencies named in paragraphs (1), (2), (3), [and (4)] 4, and 6 of section 2303(a) of this title.

(9) The head of an agency may not delegate responsibilities under this subsection to any person in a position below level IV of the Executive Schedule.

(10) In this subsection, the term “remedy coordination official”, with respect to an agency, means the person or entity in that agency who coordinates within that agency the administration of criminal, civil, administrative, and contractual remedies resulting from investigations of fraud or corruption related to procurement activities.

TITLE 42—THE PUBLIC HEALTH AND WELFARE

CHAPTER 26—NATIONAL SPACE PROGRAM

GENERAL PROVISIONS

§ 2454. Access to information

(a) Information obtained or developed by the Administrator in the performance of his functions under this Act shall be made available for public inspection, except (A) information authorized or required by Federal statute to be withheld, (B) information classified to protect the national security, and (C) information described in subsection (b): Provided, That nothing in this Act shall authorize the withholding of information by the Administrator from the duly authorized committees of the Congress.

(b) The Administrator, for a period of up to 5 years after the development of information that results from activities conducted under an agreement entered into under section 203(c) (5) and (6) of this Act [42 U.S.C. 2473(c) (5), (6)], and that would be a trade secret or commercial or financial information that is privileged or confidential under the meaning of section 552(b)(4) of title 5, United States Code, if the information had been obtained from a non-Federal party participating in such an agreement, may provide appropriate protections against the dissemination of such information, including exemption from subchapter II of chapter 5 of title 5, United States Code [5 U.S.C. 551 et seq.].

(c)(1) *The Administrator may delay, for a period not to exceed 5 years, the unrestricted public disclosure of technical data, related to a competitively sensitive technology, in the possession of, or under the control of, the Administration that has been generated in the performance of experimental, developmental, or research activities or programs conducted by, or funded in whole or in part by, the Administration, if the technical data has significant value in maintaining leadership or competitiveness, in civil and governmental aeronautical and space activities by the United States industrial base.*

(2) *The Administrator shall publish biannually in the Federal Register a list of all competitively sensitive technology areas which it believes have a significant value in maintaining the United States leadership or competitiveness in civil and governmental aeronautical and space activities. The list shall be generated after consultation with appropriate Government agencies and a diverse cross section of companies—*

(A) that conduct a significant level of research, development, engineering, and manufacturing in the United States; and

(B) the majority ownership or control of which is held by United States citizens.

(3) *The Administrator shall provide an opportunity for written objections to the list within a 60-day period after it is published. After the expiration of that 60-day period, and after consideration of all written objections received by the Administrator during that period, NASA shall issue a final list of competitively sensitive technology areas.*

(4) *For purposes of this subsection, the term “technical data” means any recorded information, including computer software, that is or may be directly applicable to the design, engineering, development, production, manufacture, or operation of products or processes that may have significant value in maintaining leadership or competitiveness in civil and governmental aeronautical and space activities by the United States industrial base.*

* * * * *

[§ 2476. Reports to the Congress

[(a) PRESIDENTIAL REPORT; TRANSMITTAL.—The President shall transmit to the Congress in January of each year a report, which shall include (1) a comprehensive description of the programed activities and the accomplishments of all agencies of the United States in the field of aeronautics and space activities during the preceding calendar year, and (2) an evaluation of such activities and accomplishments in terms of the attainment of, or the failure to attain, the objectives described in section 102(c) of this Act [42 U.S.C. 2451(c)].

[(b) RECOMMENDATIONS FOR ADDITIONAL LEGISLATION.—Any report made under this section shall contain such recommendations for additional legislation as the Administrator or the President may consider necessary or desirable for the attainment of the objectives described in section 102(c) of this Act [42 U.S.C. 2451(c)].

[(c) CLASSIFIED INFORMATION.—No information which has been classified for reasons of national security shall be included in any

report made under this section, unless such information has been declassified by, or pursuant to authorization given by, the President.】

CHAPTER 701—COMMERCIAL SPACE LAUNCH ACTIVITIES

§ 70101. Findings and purposes

(a) FINDINGS.—Congress finds that—

(1) the peaceful uses of outer space continue to be of great value and to offer benefits to all mankind;

(2) private applications of space technology have achieved a significant level of commercial and economic activity and offer the potential for growth in the future, particularly in the United States;

(3) new and innovative equipment and services are being sought, produced, and offered by entrepreneurs in telecommunications, information services, *microgravity research*, and remote sensing technologies;

(4) the private sector in the United States has the capability of developing and providing *commercial space transportation services, including in-space transportation activities and private satellite launching and associated services* that would complement the launching and associated services now available from the United States Government;

(5) the development of 【commercial launch vehicles】 *commercial space transportation including commercial launch vehicles, in-space transportation activities, reentry vehicles*, and associated services would enable the United States to retain its competitive position internationally, contributing to the national interest and economic well-being of the United States;

(6) providing 【launch】 *launch, in-space transportation, and reentry services* by the private sector is consistent with the national security and foreign policy interests of the United States and would be facilitated by stable, minimal, and appropriate regulatory guidelines that are fairly and expeditiously applied;

(7) the United States should encourage private sector 【launches】 *launches, in-space transportation activities, reentries* and associated services and, only to the extent necessary, regulate those 【launches】 *launches, in-space transportation activities, reentries* and services to ensure compliance with international obligations of the United States and to protect the public health and safety, safety of property, and national security and foreign policy interests of the United States;

(8) space transportation, including the establishment and operation of launch 【sites and complementary facilities, the providing of launch】 *sites, in-space transportation control sites, reentry sites, and complementary facilities, the providing of launch, in-space transportation, and reentry services*, the establishment of support facilities, and the providing of support services, is an important element of the transportation system of the United States, and in connection with the commerce of the United States there is a need to develop a strong space transportation infrastructure with significant private sector involvement; and

(9) the participation of State governments in encouraging and facilitating private sector involvement in space-related activity, particularly through the establishment of a space transportation-related infrastructure, including launch sites, *in-space transportation control sites*, *reentry sites*, complementary facilities, and launch site support facilities, is in the national interest and is of significant public benefit.

(b) PURPOSES.—The purposes of this chapter are—

(1) to promote economic growth and entrepreneurial activity through use of the space environment for peaceful purposes;

(2) to encourage the United States private sector to provide **[launch vehicles]** *commercial space transportation services, including launch vehicles, in-space transportation activities, reentry vehicles*, and associated services by—

(A) simplifying and expediting the issuance and transfer of commercial launch licenses; and

(B) facilitating and encouraging the use of Government-developed space technology;

(3) to provide that the Secretary of Transportation is to oversee and coordinate the conduct of commercial **[launch]** *launch, in-space transportation vehicle, and reentry* operations, issue and transfer **[commercial launch]** licenses authorizing those operations, and protect the public health and safety, safety of property, and national security and foreign policy interests of the United States; and

(4) to facilitate the strengthening and expansion of the United States space transportation infrastructure, including the enhancement of United States launch sites and launch-site support facilities, *in-space transportation vehicle control facilities, and development of reentry sites* with Government, State, and private sector involvement, to support the full range of United States space-related activities.

§ 70102. Definitions

In this chapter—

(1) “citizen of the United States” means—

(A) an individual who is a citizen of the United States;

(B) an entity organized or existing under the laws of the United States or a State; or

(C) an entity organized or existing under the laws of a foreign country if the controlling interest (as defined by the Secretary of Transportation) is held by an individual or entity described in subclause (A) or (B) of this clause.

(2) “executive agency” has the same meaning given that term in section 105 of title 5.

(3) “launch” means to place or try to place a launch vehicle and any payload *from Earth, including a reentry vehicle and its payload, if any*—

(A) in a suborbital trajectory;

(B) in Earth orbit in outer space; or

(C) otherwise in outer space.

(4) “launch property” means an item built for, or used in, the launch preparation or launch of a launch vehicle.

(5) “launch services” means—

- (A) activities involved in the preparation of a launch vehicle and payload for launch; and
- (B) the conduct of a launch.
- (6) “launch site” means the location on Earth from which a launch takes place (as defined in a license the Secretary issues or transfers under this chapter) and necessary facilities.
- (7) “launch vehicle” means—
 - (A) a vehicle built to operate in, or place a payload in, outer space; and
 - (B) a suborbital rocket.
- (8) “payload” means an **[object]** *object, including a reentry vehicle and its payload, if any, that a person undertakes to place in outer space by means of a launch vehicle, including components of the vehicle specifically designed or adapted for that object.*
- (9) “*in-space transportation vehicle*” means any vehicle designed to operate in space and designed to transport any payload or object substantially intact from one orbit to another orbit.
- (10) “*in-space transportation services*” means—
 - (A) those activities involved in the direct transportation or attempted transportation of a payload or object from one orbit to another;
 - (B) the procedures, actions, and activities necessary for conduct of those transportation services; and
 - (C) the conduct of transportation services.
- (11) “*in-space transportation control site*” means a location from which an in-space transportation vehicle is controlled or operated (as such terms may be defined in any license the Secretary issues or transfers under this chapter).
- (12) “*obtrusive space advertising*” means advertising in outer space that is capable of being recognized by a human being on the surface of the Earth without the aid of a telescope or other technological device.
- (13) “*reenter*” and “*reentry*” mean to return purposefully, or attempt to return, a reentry vehicle and payload, if any, from Earth orbit or outer space to Earth.
- (14) “*reentry services*” means—
 - (A) activities involved in the preparation of a reentry vehicle and its payload, if any, for reentry; and
 - (B) the conduct of a reentry.
- (15) “*reentry site*” means the location on Earth to which a reentry vehicle is intended to return (as defined in a license the Secretary issues or transfers under this chapter).
- (16) “*reentry vehicle*” means any vehicle designed to return substantially intact from Earth orbit or outer space to Earth.”;
- [(9)]** (17) “person” means an individual and an entity organized or existing under the laws of a State or country.
- [(10)]** (18) “State” means a State of the United States, the District of Columbia, and a territory or possession of the United States.
- [(11)]** (19) “third party” means a person except—
 - (A) the United States Government or the Government’s contractors or subcontractors involved in launch **[services]**

services, in-space transportation activities, or reentry services;

(B) a licensee or transferee under this chapter;

(C) a licensee's or transferee's contractors, subcontractors, or customers involved in launch **[services]** *services, in-space transportation activities, or reentry services; or*

(D) the customer's contractors or subcontractors involved in launch **[services]** *services, in-space transportation activities, or reentry services.*

[(12)] (20) "United States" means the States of the United States, the District of Columbia, and the territories and possessions of the United States.

§ 70103. General authority

(a) GENERAL.—The Secretary of Transportation shall carry out this chapter.

(b) FACILITATING COMMERCIAL **[LAUNCHES]** *SPACE ACTIVITIES*.—In carrying out this chapter, the Secretary shall—

(1) encourage, facilitate, and promote **[commercial space launches]** *commercial space transportation services* by the private sector; and

(2) take actions to facilitate private sector involvement in commercial space transportation activity, and to promote public-private partnerships involving the United States Government, State governments, and the private sector to build, expand, modernize, or operate **[a space launch]** *space transportation infrastructure.*

(c) EXECUTIVE AGENCY ASSISTANCE.—When necessary, the head of an executive agency shall assist the Secretary in carrying out this chapter.

§ 70104. [Restrictions on launches and operations] *Restrictions on launches, in-space transportation activities, operations, and reentries*

(a) LICENSE REQUIREMENT.—A license issued or transferred under this chapter is required for the following:

(1) for a person to launch a launch vehicle or to operate a launch **[site]** *site, an in-space transportation operations site, reentry site, or reenter a reentry vehicle*, in the United States.

(2) for a citizen of the United States (as defined in section 70102(1) (A) or (B) of this title) to launch a launch vehicle or to operate a launch **[site]** *site, an in-space transportation operations site, reentry site, or reenter a reentry vehicle*, outside the United States.

(3) for a citizen of the United States (as defined in section 70102(1)(C) of this title) to launch a launch vehicle or to operate a launch **[site]** *site, an in-space transportation operations site, reentry site, or reenter a reentry vehicle*, outside the United States and outside the territory of a foreign country unless there is an agreement between the United States Government and the government of the foreign country providing that the government of the foreign country has jurisdiction over the **[launch or operation.]** *launch, in-space transportation activity, or reentry operation.*

(4) for a citizen of the United States (as defined in section 70102(1)(C) of this title) to launch a launch vehicle or to operate a launch **[site]** *site, an in-space transportation operations site, reentry site, or reenter a reentry vehicle*, in the territory of a foreign country if there is an agreement between the United States Government and the government of the foreign country providing that the United States Government has jurisdiction over the **[launch or operation.]** *launch, in-space transportation activity, or reentry operation.*

[(b) COMPLIANCE WITH PAYLOAD REQUIREMENTS.—The holder of a launch license under this chapter may launch a payload only if the payload complies with all requirements of the laws of the United States related to launching a payload.]

(b) COMPLIANCE WITH PAYLOAD REQUIREMENTS.—The holder of a license under this chapter may launch a payload, operate an in-space transportation vehicle, or reenter a payload only if the payload or vehicle complies with all requirements of the laws of the United States related to launching a payload, operating an in-space transportation vehicle, or reentering a payload.

(c) [PREVENTING LAUNCHES.—] PREVENTING LAUNCHES, IN-SPACE TRANSPORTATION ACTIVITIES, OR REENTRIES.—The Secretary of Transportation shall establish whether all required licenses, authorizations, and permits required for a payload have been obtained. If no license, authorization, or permit is required, the Secretary may prevent the **[launch]** *launch, in-space transportation activity, or reentry* if the Secretary decides the **[launch]** *launch, in-space transportation activity, or reentry* would jeopardize the public health and safety, safety of property, or national security or foreign policy interest of the United States.

§ 70105. License applications and requirements

(a) APPLICATIONS.—A person may apply to the Secretary of Transportation for a license or transfer of a license under this chapter in the form and way the Secretary prescribes. Consistent with the public health and safety, safety of property, and national security and foreign policy interests of the United States, the Secretary, not later than 180 days after receiving an application, shall issue or transfer a license if the Secretary decides in writing that the applicant complies, and will continue to comply, with this chapter and regulations prescribed under this chapter. The Secretary shall inform the applicant of any pending issue and action required to resolve the issue if the Secretary has not made a decision not later than 120 days after receiving an application.

(b) REQUIREMENTS.—

(1) Except as provided in this subsection, all requirements of the laws of the United States applicable to the launch of a launch vehicle or the operation of a launch **[site]** *site, an in-space transportation control site, or a reentry site or the reentry of a reentry vehicle*, are requirements for a license under this chapter.

(2) The Secretary may prescribe—

(A) any term necessary to ensure compliance with this chapter, including on-site verification that a **[launch or operation]** *launch, in-space transportation activity, operation,*

or reentry complies with representations stated in the application;

(B) an additional requirement necessary to protect the public health and safety, safety of property, national security interests, and foreign policy interests of the United States; and

(C) by regulation that a requirement of a law of the United States not be a requirement for a license if the Secretary, after consulting with the head of the appropriate executive agency, decides that the requirement is not necessary to protect the public health and safety, safety of property, and national security and foreign policy interests of the United States.

(3) The Secretary may waive a requirement for an individual applicant if the Secretary decides that the waiver is in the public interest and will not jeopardize the public health and safety, safety of property, and national security and foreign policy interests of the United States.

(c) PROCEDURES AND TIMETABLES.—The Secretary shall establish procedures and timetables that expedite review of a license application and reduce the regulatory burden for an applicant.

§ 70106. Monitoring activities

(a) GENERAL REQUIREMENTS.—A licensee under this chapter must allow the Secretary of Transportation to place an officer or employee of the United States Government or another individual as an observer at a launch [site] *site, in-space transportation control site, or reentry site* the licensee uses, at a production facility or assembly site a contractor of the licensee uses to produce or assemble a launch [vehicle,] *vehicle, in-space transportation vehicle, or reentry vehicle* or at a site at which a payload is integrated with a launch [vehicle.] *vehicle, in-space transportation vehicle, or reentry vehicle*. The observer will monitor the activity of the licensee or contractor at the time and to the extent the Secretary considers reasonable to ensure compliance with the license or to carry out the duties of the Secretary under section 70104(c) of this title. A licensee must cooperate with an observer carrying out this subsection.

(b) CONTRACTS.—To the extent provided in advance in an appropriation law, the Secretary may make a contract with a person to carry out subsection (a) of this section.

§ 70108. [Prohibition, suspension, and end of launches and operation of launch sites] *Prohibition, suspension, and end of launches, in-space transportation activities, reentries, or operation of launch sites, in-space transportation control sites, or reentry sites*

(a) GENERAL AUTHORITY.—The Secretary of Transportation may prohibit, suspend, or end immediately the launch of a launch vehicle or the operation of a launch [site] *site, in-space transportation control site, in-space transportation activity, or reentry site, or reentry of a reentry vehicle*, licensed under this chapter if the Secretary decides the [launch or operation] *launch, in-space transportation activity, operation, or reentry* is detrimental to the public

health and safety, the safety of property, or a national security or foreign policy interest of the United States.

(b) **EFFECTIVE PERIODS OF ORDERS.**—An order under this section takes effect immediately and remains in effect during a review under section 70110 of this title.

§ 70109. [Preemption of scheduled launches] *Preemption of scheduled launches, in-space transportation activities, or reentries*

(a) **GENERAL.**—With the cooperation of the Secretary of Defense and the Administrator of the National Aeronautics and Space Administration, the Secretary of Transportation shall act to ensure that a launch *or reentry* of a payload is not preempted from access to a United States Government launch **[site]** *site, reentry site, or launch property, nor shall an in-space transportation activity or operation be preempted*, except for imperative national need, when a launch date commitment *or reentry date commitment* from the Government has been obtained for a launch *or reentry* licensed under this chapter. A licensee or transferee preempted from access to a launch **[site]** *site, reentry site, or launch property* does not have to pay the Government any amount for launch **[services]** *services, or services related to a reentry*, attributable only to the scheduled launch *or reentry* prevented by the preemption. A *licensee or transferee preempted from access to a reentry site does not have to pay the Government agency responsible for the preemption any amount for reentry services attributable only to the scheduled reentry prevented by the preemption.*

(b) **IMPERATIVE NATIONAL NEED DECISIONS.**—In consultation with the Secretary of Transportation, the Secretary of Defense or the Administrator shall decide when an imperative national need requires preemption under subsection (a) of this section. That decision may not be delegated.

(c) **REPORTS.**—In cooperation with the Secretary of Transportation, the Secretary of Defense or the Administrator, as appropriate, shall submit to Congress not later than 7 days after a decision to preempt under subsection (a) of this section, a report that includes an explanation of the circumstances justifying the decision and a schedule for ensuring the prompt launching *or reentry* of a preempted payload.

§ 70109a. Space advertising

(a) **LICENSING.**—Notwithstanding the provisions of this chapter or any other provision of law, the Secretary shall not—

(1) issue or transfer a license under this chapter; or

(2) waive the license requirements of this chapter;

for the launch of a payload containing any material to be used for the purposes of obtrusive space advertising.

(b) **LAUNCHING.**—No holder of a license under this chapter may launch a payload containing any material to be used for purposes of obtrusive space advertising on or after the date of enactment of the National Aeronautics and Space Administration Authorization Act, Fiscal Year 1996.

(c) **COMMERCIAL SPACE ADVERTISING.**—Nothing in this section shall apply to nonobtrusive commercial space advertising, including

advertising on commercial space transportation vehicles, space infrastructure, payloads, space launch facilities, and launch support facilities.

§ 70110. Administrative hearings and judicial review

(a) ADMINISTRATIVE HEARINGS.—The Secretary of Transportation shall provide an opportunity for a hearing on the record to—

(1) an applicant under this chapter, for a decision of the Secretary under section 70105(a) of this title to issue or transfer a license with terms or deny the issuance or transfer of a license;

(2) an owner or operator of a payload under this chapter, for a decision of the Secretary under section 70104(c) of this title to prevent the **[launch]** *launch, in-space transportation activity, or reentry* of the payload; and

(3) a licensee under this chapter, for a decision of the Secretary under—

(A) section 70107 (b) or (c) of this title to modify, suspend, or revoke a license; or

(B) section 70108(a) of this title to prohibit, suspend, or end a launch or operation of a launch **[site]** *site, in-space transportation control site, in-space transportation activity, reentry site, or reentry of a reentry vehicle*, licensed by the Secretary.

(b) JUDICIAL REVIEW.—A final action of the Secretary under this chapter is subject to judicial review as provided in chapter 7 of title 5.

§ 70111. Acquiring United States Government property and services

(a) GENERAL REQUIREMENTS AND CONSIDERATIONS.—

(1) The Secretary of Transportation shall facilitate and encourage the acquisition by the private sector and State governments of—

(A) launch *or reentry* property of the United States Government that is excess or otherwise is not needed for public use; and

(B) launch services, *in-space transportation activities, or reentry services*, including utilities, of the Government otherwise not needed for public use.

(2) In acting under paragraph (1) of this subsection, the Secretary shall consider the commercial availability on reasonable terms of substantially equivalent launch *or reentry* property or launch **[services]** *services, in-space transportation activities, or reentry services*, from a domestic source.

(b) PRICE.—

(1) In this subsection, “direct costs” means the actual costs that—

(A) can be associated unambiguously with a commercial **[launch]** *launch, in-space transportation activity, or reentry effort*; and

(B) the Government would not incur if there were no commercial **[launch]** *launch, in-space transportation activity, or reentry effort*.

(2) In consultation with the Secretary, the head of the executive agency providing the property or service under subsection (a) of this section shall establish the price for the property or service. The price for—

(A) acquiring launch property by sale or transaction instead of sale is the fair market value;

(B) acquiring launch property (except by sale or transaction instead of sale) is an amount equal to the direct costs, including specific wear and tear and property damage, the Government incurred because of acquisition of the property; and

(C) launch **services** *services, in-space transportation activities or services, or reentry services* is an amount equal to the direct costs, including the basic pay of Government civilian and contractor personnel, the Government incurred because of acquisition of the services.

(c) **COLLECTION BY SECRETARY.**—The Secretary may collect a payment under this section with the consent of the head of the executive agency establishing the price. Amounts collected under this subsection shall be deposited in the Treasury. Amounts (except for excess launch property) shall be credited to the appropriation from which the cost of providing the property or services was paid.

[(d) **COLLECTION BY OTHER GOVERNMENTAL HEADS.**—The head of a department, agency, or instrumentality of the Government may collect a payment for an activity involved in producing a launch vehicle or its payload for launch if the activity was agreed to by the owner or manufacturer of the launch vehicle or payload.]

*(d) **COLLECTION BY OTHER GOVERNMENTAL HEADS.**—The head of a department, agency, or instrumentality of the Government may collect a payment for any activity involved in producing a launch vehicle, in-space transportation vehicle, or reentry vehicle or its payload for launch, in-space transportation activity, or reentry if the activity was agreed to by the owner or manufacturer of the launch vehicle, in-space transportation vehicle, reentry vehicle, or payload.*

§ 70112. Liability insurance and financial responsibility requirements

(a) **GENERAL REQUIREMENTS.**—

(1) When a license is issued or transferred under this chapter, the licensee or transferee shall obtain liability insurance or demonstrate financial responsibility in amounts to compensate for the maximum probable loss from claims by—

(A) a third party for death, bodily injury, or property damage or loss resulting from an activity carried out under the license; and

(B) the United States Government against a person for damage or loss to Government property resulting from an activity carried out under the license.

(2) The Secretary of Transportation shall determine the amounts required under paragraph (1)(A) and (B) of this subsection, after consulting with the Administrator of the National Aeronautics and Space Administration, the Secretary of the Air Force, and the heads of other appropriate executive agencies.

(3) For the total claims related to one ~~launch,~~ *launch or reentry, or to the operations of each in-space transportation vehicle*, a licensee or transferee is not required to obtain insurance or demonstrate financial responsibility of more than—

(A)(i) \$500,000,000 under paragraph (1)(A) of this subsection; or

(ii) \$100,000,000 under paragraph (1)(B) of this subsection; or

(B) the maximum liability insurance available on the world market at reasonable cost if the amount is less than the applicable amount in clause (A) of this paragraph.

(4) An insurance policy or demonstration of financial responsibility under this subsection shall protect the following, to the extent of their potential liability for involvement in launch ~~services,~~ *services, in-space transportation activities, or reentry services* at no cost to the Government:

(A) the Government.

(B) executive agencies and personnel, contractors, and subcontractors of the Government.

(C) contractors, subcontractors, and customers of the licensee or transferee.

(D) contractors and subcontractors of the customer.

(b) RECIPROCAL WAIVER OF CLAIMS.—

(1) A license issued or transferred under this chapter shall contain a provision requiring the licensee or transferee to make a reciprocal waiver of claims with its contractors, subcontractors, and customers, and contractors and subcontractors of the customers, involved in launch ~~services,~~ *services, in-space transportation activities, or reentry services* under which each party to the waiver agrees to be responsible for property damage or loss it sustains, or for personal injury to, death of, or property damage or loss sustained by its own employees resulting from an activity carried out under the *applicable* license.

(2) The Secretary of Transportation shall make, for the Government, executive agencies of the Government involved in launch ~~services,~~ *services, in-space transportation activities, or reentry services* and contractors and subcontractors involved in launch ~~services,~~ *services, in-space transportation activities, or reentry services* a reciprocal waiver of claims with the licensee or transferee, contractors, subcontractors, and customers of the licensee or transferee, and contractors and subcontractors of the customers, involved in launch ~~services,~~ *services, in-space transportation activities, or reentry services* under which each party to the waiver agrees to be responsible for property damage or loss it sustains, or for personal injury to, death of, or property damage or loss sustained by its own employees resulting from an activity carried out under the *applicable* license. The waiver applies only to the extent that claims are more than the amount of insurance or demonstration of financial responsibility required under subsection (a)(1)(B) of this section. After consulting with the Administrator and the Secretary of the Air Force, the Secretary of Transportation may waive, for the Government and a department, agency, and instrumentality of the Government, the right to recover damages for dam-

age or loss to Government property to the extent insurance is not available because of a policy exclusion the Secretary of Transportation decides is usual for the type of insurance involved.

(c) DETERMINATION OF MAXIMUM PROBABLE LOSSES.—The Secretary of Transportation shall determine the maximum probable losses under subsection (a)(1)(A) and (B) of this section associated with an activity under a license not later than 90 days after a licensee or transferee requires a determination and submits all information the Secretary requires. The Secretary shall amend the determination as warranted by new information.

(d) ANNUAL REPORT.—

(1) Not later than November 15 of each year, the Secretary of Transportation shall submit to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on [Science, Space, and Technology] *Science* of the House of Representatives a report on current determinations made under subsection (c) of this section related to all issued licenses and the reasons for the determinations.

(2) Not later than May 15 of each year, the Secretary of Transportation shall review the amounts specified in subsection (a)(3)(A) of this section and submit a report to Congress that contains proposed adjustments in the amounts to conform with changed liability expectations and availability of insurance on the world market. The proposed adjustment takes effect 30 days after a report is submitted.

(e) [LAUNCHES] *LAUNCHES, IN-SPACE TRANSPORTATION ACTIVITIES, OR REENTRIES INVOLVING GOVERNMENT FACILITIES AND PERSONNEL*.—The Secretary of Transportation shall establish requirements consistent with this chapter for proof of financial responsibility and other assurances necessary to protect the Government and its executive agencies and personnel from liability, death, bodily injury, or property damage or loss as a result of a launch or operation of a launch [site] *site, in-space transportation control site, or control or an in-space transportation vehicle or activity, or reentry site or a reentry* involving a facility or personnel of the Government. The Secretary may not relieve the Government of liability under this subsection for death, bodily injury, or property damage or loss resulting from the willful misconduct of the Government or its agents.

(f) COLLECTION AND CREDITING PAYMENTS.—The head of a department, agency, or instrumentality of the Government shall collect a payment owed for damage or loss to Government property under its jurisdiction or control resulting from an activity carried out under a license issued or transferred under this chapter. The payment shall be credited to the current applicable appropriation, fund, or account of the department, agency, or instrumentality.

§ 70113. Paying claims exceeding liability insurance and financial responsibility requirements

(a) GENERAL REQUIREMENTS.—

(1) To the extent provided in advance in an appropriation law or to the extent additional legislative authority is enacted providing for paying claims in a compensation plan submitted

under subsection (d) of this section, the Secretary of Transportation shall provide for the payment by the United States Government of a successful claim (including reasonable litigation or settlement expenses) of a third party against a licensee or transferee under this chapter, a contractor, subcontractor, or customer of the licensee or transferee, or a contractor or subcontractor of a customer, resulting from an activity carried out under the license issued or transferred under this chapter for death, bodily injury, or property damage or loss resulting from an activity carried out under the license. However, claims may be paid under this section only to the extent the total amount of successful claims related to one ~~launch—~~ *launch, operation of one in-space transportation vehicle, or one reentry—*

(A) is more than the amount of insurance or demonstration of financial responsibility required under section 70112(a)(1)(A) of this title; and

(B) is not more than \$ 1,500,000,000 (plus additional amounts necessary to reflect inflation occurring after January 1, 1989) above that insurance or financial responsibility amount.

(2) The Secretary may not provide for paying a part of a claim for which death, bodily injury, or property damage or loss results from willful misconduct by the licensee or transferee. To the extent insurance required under section 70112(a)(1)(A) of this title is not available to cover a successful third party liability claim because of an insurance policy exclusion the Secretary decides is usual for the type of insurance involved, the Secretary may provide for paying the excluded claims without regard to the limitation contained in section 70112(a)(1).

(b) NOTICE, PARTICIPATION, AND APPROVAL.—Before a payment under subsection (a) of this section is made—

(1) notice must be given to the Government of a claim, or a civil action related to the claim, against a party described in subsection (a)(1) of this section for death, bodily injury, or property damage or loss;

(2) the Government must be given an opportunity to participate or assist in the defense of the claim or action; and

(3) the Secretary must approve any part of a settlement to be paid out of appropriations of the Government.

(c) WITHHOLDING PAYMENTS.—The Secretary may withhold a payment under subsection (a) of this section if the Secretary certifies that the amount is not reasonable. However, the Secretary shall deem to be reasonable the amount of a claim finally decided by a court of competent jurisdiction.

(d) SURVEYS, REPORTS, AND COMPENSATION PLANS.—

(1) If as a result of an activity carried out under a license issued or transferred under this chapter the total of claims related to one launch is likely to be more than the amount of required insurance or demonstration of financial responsibility, the Secretary shall—

(A) survey the causes and extent of damage; and

(B) submit expeditiously to Congress a report on the results of the survey.

(2) Not later than 90 days after a court determination indicates that the liability for the total of claims related to one launch may be more than the required amount of insurance or demonstration of financial responsibility, the President, on the recommendation of the Secretary, shall submit to Congress a compensation plan that—

(A) outlines the total dollar value of the claims;

(B) recommends sources of amounts to pay for the claims;

(C) includes legislative language required to carry out the plan if additional legislative authority is required; and

(D) for a single event or incident, may not be for more than \$ 1,500,000,000.

(3) A compensation plan submitted to Congress under paragraph (2) of this subsection shall—

(A) have an identification number; and

(B) be submitted to the Senate and the House of Representatives on the same day and when the Senate and House are in session.

(e) CONGRESSIONAL RESOLUTIONS.—

(1) In this subsection, “resolution”—

(A) means a joint resolution of Congress the matter after the resolving clause of which is as follows: “That the Congress approves the compensation plan numbered _____ submitted to the Congress on — —, 19—.”, with the blank spaces being filled appropriately; but

(B) does not include a resolution that includes more than one compensation plan.

(2) The Senate shall consider under this subsection a compensation plan requiring additional appropriations or legislative authority not later than 60 calendar days of continuous session of Congress after the date on which the plan is submitted to Congress.

(3) A resolution introduced in the Senate shall be referred immediately to a committee by the President of the Senate. All resolutions related to the same plan shall be referred to the same committee.

(4)(A) If the committee of the Senate to which a resolution has been referred does not report the resolution within 20 calendar days after it is referred, a motion is in order to discharge the committee from further consideration of the resolution or to discharge the committee from further consideration of the plan.

(B) A motion to discharge may be made only by an individual favoring the resolution and is highly privileged (except that the motion may not be made after the committee has reported a resolution on the plan). Debate on the motion is limited to one hour, to be divided equally between those favoring and those opposing the resolution. An amendment to the motion is not in order. A motion to reconsider the vote by which the motion is agreed to or disagreed to is not in order.

(C) If the motion to discharge is agreed to or disagreed to, the motion may not be renewed and another motion to dis-

charge the committee from another resolution on the same plan may not be made.

(5)(A) After a committee of the Senate reports, or is discharged from further consideration of, a resolution, a motion to proceed to the consideration of the resolution is in order at any time, even though a similar previous motion has been disagreed to. The motion is highly privileged and is not debatable. An amendment to the motion is not in order. A motion to reconsider the vote by which the motion is agreed to or disagreed to is not in order.

(B) Debate on the resolution referred to in subparagraph (A) of this paragraph is limited to not more than 10 hours, to be divided equally between those favoring and those opposing the resolution. A motion further to limit debate is not debatable. An amendment to, or motion to recommit, the resolution is not in order. A motion to reconsider the vote by which the resolution is agreed to or disagreed to is not in order.

(6) The following shall be decided in the Senate without debate:

(A) a motion to postpone related to the discharge from committee.

(B) a motion to postpone consideration of a resolution.

(C) a motion to proceed to the consideration of other business.

(D) an appeal from a decision of the chair related to the application of the rules of the Senate to the procedures related to resolution.

(f) APPLICATION.—This section applies to a license issued or transferred under this chapter for which the Secretary receives a complete and valid application not later than December 31, 1999.

§ 70115. Enforcement and penalty

(a) PROHIBITIONS.—A person may not violate this chapter, a regulation prescribed under this chapter, or any term of a license issued or transferred under this chapter.

(b) GENERAL AUTHORITY.—

(1) In carrying out this chapter, the Secretary of Transportation may—

(A) conduct investigations and inquiries;

(B) administer oaths;

(C) take affidavits; and

(D) under lawful process—

(i) enter at a reasonable time a launch site, *in-space transportation control site*, or *reentry site*, production facility, assembly site of a launch [vehicle,] *vehicle*, *in-space transportation vehicle*, or *reentry vehicle* or site at which a payload is integrated with a launch [vehicle] *vehicle*, *in-space transportation vehicle*, or *reentry vehicle* to inspect an object to which this chapter applies or a record or report the Secretary requires be made or kept under this chapter; and

(ii) seize the object, record, or report when there is probable cause to believe the object, record, or report

was used, is being used, or likely will be used in violation of this chapter.

(2) The Secretary may delegate a duty or power under this chapter related to enforcement to an officer or employee of another executive agency with the consent of the head of the agency.

(c) CIVIL PENALTY.—

(1) After notice and an opportunity for a hearing on the record, a person the Secretary finds to have violated subsection (a) of this section is liable to the United States Government for a civil penalty of not more than \$ 100,000. A separate violation occurs for each day the violation continues.

(2) In conducting a hearing under paragraph (1) of this subsection, the Secretary may—

(A) subpoena witnesses and records; and

(B) enforce a subpoena in an appropriate district court of the United States.

(3) The Secretary shall impose the civil penalty by written notice. The Secretary may compromise or remit a penalty imposed, or that may be imposed, under this section.

(4) The Secretary shall recover a civil penalty not paid after the penalty is final or after a court enters a final judgment for the Secretary.

§ 70117. Relationship to other executive agencies, laws, and international obligations

(a) EXECUTIVE AGENCIES.—Except as provided in this chapter, a person is not required to obtain from an executive agency a license, approval, waiver, or exemption to launch a launch vehicle or operate a launch **[site.]** *site, perform in-space transportation activities or operate an in-space transportation control site or reentry site, or reenter a reentry vehicle.*

(b) FEDERAL COMMUNICATIONS COMMISSION AND SECRETARY OF COMMERCE.—This chapter does not affect the authority of—

(1) the Federal Communications Commission under the Communications Act of 1934 (47 U.S.C. 151 et seq.); or

(2) the Secretary of Commerce under the Land Remote-Sensing Commercialization Act of 1984 (15 U.S.C. 4201 et seq.).

(c) STATES AND POLITICAL SUBDIVISIONS.—A State or political subdivision of a State—

(1) may not adopt or have in effect a law, regulation, standard, or order inconsistent with this chapter; but

(2) may adopt or have in effect a law, regulation, standard, or order consistent with this chapter that is in addition to or more stringent than a requirement of, or regulation prescribed under, this chapter.

(d) CONSULTATION.—The Secretary of Transportation is encouraged to consult with a State to simplify and expedite the approval of a space **[launch]** *launch, perform an in-space transportation activity, or reentry activity.*

(e) FOREIGN COUNTRIES.—The Secretary of Transportation shall—

(1) carry out this chapter consistent with an obligation the United States Government assumes in a treaty, convention, or

agreement in force between the Government and the government of a foreign country; and

(2) consider applicable laws and requirements of a foreign country when carrying out this chapter.

[(f) LAUNCH NOT AN EXPORT.—A launch vehicle or payload that is launched is not, because of the launch, an export for purposes of a law controlling exports.

[(g) NONAPPLICATION.—This chapter does not apply to—

[(1) a launch, operation of a launch vehicle or launch site, or other space activity the Government carries out for the Government; or

[(2) planning or policies related to the launch, operation, or activity.]

(f) *LAUNCH NOT AN EXPORT OR IMPORT.*—A launch vehicle, reentry vehicle, or payload that is launched or reentered is not, because of the launch or reentry, an export or import for purposes of a law controlling exports or imports.

(g) *NONAPPLICATION.*—This chapter does not apply to—

(1) a launch, in-space transportation activity, reentry, operation of a launch vehicle, in-space transportation vehicle, or reentry vehicle, or of a launch site, in-space transportation control site, or reentry site, or other space activity the Government carries out for the Government; or

(2) planning or policies related to the launch, in-space transportation activity, reentry, or operation.

§ 70118. User fees

[The Secretary of Transportation may collect a user fee for a regulatory or other service conducted under this chapter [49 U.S.C. 70101 et seq.] only if specifically authorized by this chapter [49 U.S.C. 70101 et seq.].]

§ 70120. Report to Congress

The Secretary of Transportation shall submit to Congress an annual report to accompany the President's budget request that—

(1) describes all activities undertaken under this chapter, including a description of the process for the application for and approval of licenses under this chapter and recommendations for legislation that may further commercial launches and reentries; and

(2) reviews the performance of the regulatory activities and the effectiveness of the Office of Commercial Space Transportation.